
TO STUDY THE SCIENTIFIC CREATIVITY OF X GRADE STUDENTS WITH RESPECT TO THEIR GENDER AND ACADEMIC ACHIEVEMENTS

Monika Sharma
Assistant Profesor
Ambika College of Education, Kharar
monu131983@gmail.com

ABSTRACT

Creativity is one of the most mysterious subjects in educational psychology, and is one of the most important subjects not only in educational psychology but also in the entire educational field. The present study is aimed at studying the scientific creativity of X grade students .The study is designed to compare the scientific creativity with respect to their gender and academic achievements. It was found that the difference between scientific creativity with respect to gender and academic achievements is far much than the expectations. Male students possessed higher scientific creativity than female students and first divisioners possessed higher scientific creativity than second divisioners.

Introduction:

“Those who show originality and ability to integrate the elements of situation into harmonious whole weather as a parent, a doctor or football player are leading creative lives”-

Ruch

To develop creativity in science, first we must understand what unique about science as field of human knowledge. Science involves the study of the physical or material world. In science, we study all aspects of nature, which consists of all material things, including man and environment. The scientific method, which is considered a refinement of the human cognitive process, is traditionally described as a chronology of activities which begins with a hypothesis to solve a problem or explain phenomenon in the physical world. This is followed by observations and experiments to test the hypothesis, and it ends with the hypothesis being proven right or wrong. Deductive and inductive reasoning, analytical thinking and synthesis, are exercise throughout this process. Today science is conducted in a less structured way and generally involves the continuous interplay of empirical, experimental and rational methods. This is aimed at understanding the underlying principle, mechanism or function of a physical , chemical or biological phenomena. The scientific facts or ‘truth’ discovered and propounded by scientists must be shown to be verifiable and reproducible; being drawn from conclusions obtained using methods which are as objective and quantitative as possible. Indeed, through the years, certain scientific ‘truths’ have been overturned or disproved by new ones depending on the field of interest or specialization in science, and they are countless today. Now benefits from a great deal



of experimentation, manipulation, and mathematical modeling, due to the development of new techniques in cell biology and molecular engineering and the availability of very powerful instruments and computers.

NEED AND SIGNIFICANCE

The important question that arises for the present study is what the need importance of studying the scientific creativity of secondary school students?

Creativity is the ultimate answer of the man's problems. Innovation of new ideas, things and ultimately the civilization of life. The value and worth of this potential is unlimited. The future of our nation depends upon the creative talents of the future citizens of society. Therefore, creativity has become a chief psychological motive of the twentieth century. Creativity is a kind of psychic wonder.

Creativity has a strong and engaged history. But the topic scientific creativity is quite recent. There are only a little report on creativeness in the scientific literature. So research in this field is necessary to know that scientific creativity is functional or problem solving type. It necessarily involves situations concerning the solutions of mechanical and social problem with a touch of abstract creativity, which helps in scientific inventions. Scientific inventions as radio, T.V., computer are the sources of development of society. Invention of different types of technical machines are the result of scientific creativity, which are quite useful in ones day to day life to make life easy, smooth and full of interest.

One more question arises here that, why Indian talent has failed to come up to the desired level in the scientific fields in spite of considerable resources being spent on its development ? For the answer of this question present study is needed and from above discussion it seems clear scientific creativity is necessary for a successful life. Hence it can safely said that the study on scientific creativity of X class students will trace out the problem concerned with its possession and helps in the development of such an important trait i.e. scientific creativity.

STATEMENT OF THE PROBLEM

TO STUDY THE SCIENTIFIC CREATIVITY OF X GRADE STUDENTS WITH RESPECT TO THEIR GENDER AND ACADEMIC ACHIEVEMENTS.

OBJECTIVES OF THE STUDY

1. To study the scientific creativity among 10th class students with respect to their Gender.
2. To study the scientific creativity among 10th class students with respect to their academic achievement.
3. To find out difference in scientific creativity of male and female 10th class students.



4. To find out difference in scientific creativity of students with first division and second division.
5. To find out difference in scientific creativity of male students with first division and male students with second division.
6. To find out difference in scientific creativity of female students with first division and female students with second division.

HYPOTHESES OF THE STUDY

1. There exists no significant difference among male and female 10th class students in their scientific creativity.
2. There exists no significant difference in scientific creativity of students with first division and students with second division.
3. There exists no significant difference in scientific creativity of male students with first division and male students with second division.
4. There exists no significant difference in scientific creativity of female students with first division and female students with second division.

DELIMITATION OF THE STUDY

The problem is delimited to the following areas:-

1. To Govt. Schools of Hamirpur district.
2. To 10th class students of Hamirpur district.

METHODOLOGY

The Descriptive survey method was used for present investigation. Students were divided into groups on the basis of their gender and academic achievements.

SAMPLE

The sample of this investigation comprised of 100 pupils studying in various Govt. Sr. Sec. Schools of 'Hamirpur' and 'Bhoranj' Block. Control group has been divided into 4 sub groups, each consisting of 25 students.

TOOL USED

'Verbal Test of Scientific Creativity for 10th class students' by Dr.V.P.Sharma and Dr.J.P.Shukla was used in present study.



SCORING

Scoring was done with the help of scoring processor provided with the tool. While scoring it is to be kept in mind that each item is to be scored for fluency, flexibility and originality.

STATISTICAL TECHNIQUES USED

The following statistical techniques were employed for the analysis of data.

1. After scoring descriptive statistical techniques such as Mean, S.D., SEM were worked out to study the nature of distribution of scores of scientific creativity among secondary school students.
2. With the help of key value, significance was seen, t value was found for the following combination :-
 - (I) Male and female of the whole sample.
 - (II) Students with first division and second division of the whole sample.
 - (III) Males with first division and males with second division of the whole sample.
 - (IV) Females with first division and females with second division of the whole sample.

Table 1.1
(For large sample)

Mean, S.D., SEM and t-ratio of scientific creativity for males and females

Sr.No.	Variable	Sample	No. of Students	Mean	S.D.	S.E.M	t-ratio
1.	Scientific creativity	Males	50	87.22	11.18	0.35	4.57
2.	Scientific creativity	Females	50	85.62	13.49	0.35	

Table 1.2

Mean, S.D., S.E.M and t-ratio of scientific creativity of students with first division and students with second division.

Sr.No.	Variable	Sample	No. of Students	Mean	S.D.	SEM	t-ratio
1.	Scientific creativity	Students with 1 st division	50	95.40	12.86	0.35	51.31



2.	Scientific creativity	Students with 2 nd division	50	77.40	11.87	0.35	
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Table 1.3
(For small sample)

Mean, S.D., SEM and t-ratio of scientific creativity of male students with first division and male students with second division.

Sr.No.	Variable	Sample	No. of Students	Mean	S.D.	SEM	t-ratio
1.	Scientific creativity	Students with 1 st division	25	98.68	4.65	1.32	17.42
2.	Scientific creativity	Students with 2 nd division	25	75.76	4.65	1.32	

Table 1.4

Mean, S.D., SEM and t-ratio of scientific creativity of female students with first division and female students with second division.

Sr.No.	Variable	Sample	No. of Students	Mean	S.D.	SEM	t-ratio
1.	Scientific creativity	Students with 1 st division	25	92.12	5.62	1.59	8.18
2.	Scientific creativity	Students with 2 nd division	25	79.12	5.62	1.59	

INTERPRETATION OF THE RESULTS

(A) **Gender:-** Table 1.1 shows that calculated t-ratio for main effect of Gender comes out to be 4.57 which is more than the table value of t at 0.05 level of significance with df (98) 1.98

$$\begin{aligned}
 df &= (N_1-1) + (N_2-1) \\
 &= (50 - 1) + (50 - 1) \\
 &= 49 + 49 \\
 &= 98
 \end{aligned}$$

Shows the value of 't' at 100 with respect to 0.05 level of significance.

It means that our **first Null Hypothesis rejected. There is no significant difference between scientific creativity of male and female students is accepted.**

(B) **Academic achievement:-**



Table 1.2 shows that calculated t-ratio for main effect of Academic achievement comes out to be 51.31 which is greater than the table value of t at 0.05 level of significance with df (98) 1.98. It means our **second Null Hypothesis rejected. There is no significant difference between scientific creativity of students with first division and students with second division are accepted.**

(C) Male students with first division and male students with second division :-

Table 1.3 shows that calculated value of t-ratio for main effect of Academic achievement on males comes out to be 17.42 which is greater than value of t at 0.05 level of significance with df (48) 2.01.

$$\begin{aligned} df &= (N_1 - 1) + (N_2 - 1) \\ &= (25 - 1) + (25 - 1) \\ &= 24 + 24 \\ df &= 48 \end{aligned}$$

Shows the value of 't' at 50 with respect to 0.05 level of significance .

It means our **third null hypothesis rejected. There is no significant difference between scientific creativity of male students with first division and second division is accepted.**

(D) Female students with first division and female students with second division:-

Table 1.4 shows that calculated t - ratio for main effect of academic achievement on female comes out to be 8.18 which is greater than the table value of significance with df (48) 2.01.

It means that our **fourth Null Hypothesis rejected. There is no significant difference between scientific creativity of female students with first division and female students with second division are accepted.**

FINDINGS AND CONCLUSIONS

After discussing the results the investigator has reached the following conclusion.

- (1) The difference between scientific creativity of male and female students of 10th class is significant. It means scientific creativity possessed by male students is not equal to the scientific creativity possessed by female students.
- (2) The difference between scientific creativity of students with first division and students with second division of 10th class is significant. It means scientific creativity possessed by students with first division is not equal to the scientific creativity possessed by students with second division.
- (3) The difference between scientific creativity of male students with first division and male students with second division is significant. It means scientific creativity possessed by male students with



first division is not equal to the scientific creativity possessed by male students with second division.

- (4) The difference between scientific creativity of female students with first division and female students with second division is significant. It means scientific creativity possessed by female students with first division is not equal to the scientific creativity possessed by female students with second division.

EDUCATIONAL IMPLICATIONS

The recent interest in scientific creativity as a field of research, not only in United States and other developed countries but also in India, is due to a changed outlook on the part of educators with regard to the desired outcomes of education and a feeling based on observation and empirical research that people who make creative contribution to the society are not necessarily those who possess high intelligence but those who possess high levels of creative talent.

- (1) It has been found in this investigation that sex differences were significant, boys tended to score better than girls. Therefore girls should be given special attention and they should be encouraged to take up various types of creative activities. Equal emphasis should be given to male and female characters as depicted in the books, curricular and co-curricular activities, thereby instilling confidence among girls.
- (2) It has been found in this investigation that academic differences are significant. Students with first division tended to score better than second division. Therefore students with a low academic achievement should be given special attention and they should be encouraged to take up various types of creative activities. It is an accepted fact that over emphasis on academic achievement affects the creativity of the child. There is no gain saying giving preferential treatment to first divisioners in family kills the self- confidence of the second divisioners. So parents and teachers should think in terms of equality of scientific creativity among all types of children.
- (3) Understanding and cooperation between parents and teachers are necessary for smooth counting of growth as the child moves from house into a different environment at school.
- (4) The school should play an important role in fostering scientific creativity by making the whole system of education need based and action oriented.

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