CHAPTER-III
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REVIEW OF RELATED LITERATURE AND HYPOTHESES

In a bid to keep himself abreast of the work already done on the subject, to acquaint himself of the procedure adopted to explore the field, to avoid pitfalls of the past researches and the repetition of the field already covered, the investigator made a thorough search in the literature from encyclopaedia, research abstracts, thesis, journals and books.

In the following pages, under various sub-heads an attempt has been made to describe those studies having adequate relevance to the present problem in order to frame the hypotheses for the present study.
Bhagwat (1991) developed a training package in the subject of mathematics. The findings supported the facilitation of creativity in mathematics using that training package.

Soch (1992) studied the effectiveness of certain curricular activities involving the use of problem solving ability on the development of creative thinking. It was revealed that the use of thee activities in the filed of science was found to be effective in the development of creativity.

Rajnish (1998) in his study on a sample of 600 students of X+1 class taken from senior secondary schools of Punjab state revealed that variable of problem solving ability was found to be significantly positively correlated with the scientific creativity as obtained t-value was significant at 0.01 level of significance.

Prakash (2000) in his study on a sample of 400 students of VII class studying in the elementary school/high schools of Chandigarh revealed that problem solving ability of the students has significant positive correlation with the variable of
mathematical creativity at 0.01 level of significance. Sood (1999) also obtained similar findings.

3.1 ACHIEVEMENT AND MATHEMATICAL CREATIVITY

Crocker (1968) found flexibility significantly related to teaching competency of student teachers \((r = 0.41)\). Cortis (1969) also reported the optimum and significant correlation between the figural elaboration and teaching success \((r = 0.34)\). Raina (1970) also reported the optimum and significant correlation between the figural elaboration and teaching success \((r = 0.34)\).

Basu (1983) in his study on a random sample of 400 high school students (both boys and girls) studied the relationship of creativity, intelligence and academic achievement. Correlations between the variables of intelligence, creativity and academic achievement were found to be highly positive significant.

Gakhar (1984) in one of the studies on 170 school students in IX Class of Abohar (Punjab) found that fluency (F), flexibility (X), originality and total creativity (TVC) and
variable of intelligence are significantly positively correlated with achievement in mathematics. It was further found that out of three measures of creativity, the fluency (F) is more correlated as compared to other two measures.

Goyal (1994) examined the relationship of creative thinking abilities and teaching success. 500 B.Ed. students randomly selected from five colleges of Education in Punjab were administered Form A of the Torrance Test of Creative Thinking both verbal and figural, after necessary adaptation. The coefficient of correlation were computed between the subjects' creativity scores on one hand and the scores obtained by them in their final skill in teaching and theory examination—the two fold criteria of determining teaching success—on the other hand. Results indicated that all the coefficients of correlation between the verbal creativity measures and the criterion measures were low but positive and non-significant at 0.01 level. However, only one measure of figural creativity was found significantly correlated with the theory criterion and three with the skill in teaching criterion. The evidence obtained from the results of this study indicates that elaboration in figural creativity is the chief predictor of success in teaching.
The study conducted by Gakhar (1985) on a sample of 170 students of IX Class revealed that:

i. There is significant correlation between measures of intelligence and creativity taken singularly on one side and achievement on mathematics on the other side.

ii. Intelligence and achievement in mathematics free from creativity and also creativity and achievement in mathematics free from intelligence remain significant correlated.

iii. Intelligence and creativity are equally good predictors of achievement in mathematics.

iv. Conjoint effect of intelligence and creativity is higher as compared to their respective prediction in respect of mathematical achievement.

Singh (1987) made an attempt to explore the relationship of creative thinking and intelligence with academic achievement of high school students both boys and girls, by analytical approach making use of 2x2x2 factorial design. A sample of 300 students, 154 boys and 146 girls was administered General Mental Ability Test and Verbal Test of Creative Thinking to measure intelligence and creative thinking. The
annual matriculation marks of students were used as academic achievement. The high creative high school students have been found to be high achievers, in comparison to low creatives, for both boys and girls and also at high and low levels of intelligence. Further, high creative differ more markedly in their academic performance from low creative especially at high intelligence level for girls and low intelligence level among boys.

Yadav (1986) attempted to find the correlation between intelligence and creativity of high school arts group students. Sample consisted of 50 students belonging to Govt. Inter College, Pauri Garhwal (N = 30) and Govt. Inter College, Shrinagar, Garhwal (N = 20). Intelligence and Creativity were found to be positive and significantly correlated.

Bhawalkar (1992) studied the relationship between intelligence and scientific creativity. The sample consisted of 663 students of Class IX and X. It was found that students with high intelligence were found to possess high scientific creativity.

Academic achievement and creativity were also studied in relation to each other by researchers like Pandey
(1992). He also found high correlation between academic achievement and creativity.

Sumangala (1995) investigated the relationship between psychological variables and mathematical achievement of 750 students (362 boys and 388 girls) of IXth class drawn from twenty schools of five revenue districts of Kerala. The study revealed high extent of relationship between psychological variables and achievement in mathematics.

Sood (1999) in her study on 460 students of X + 1 stage (260 from residential schools and 200 from non residential schools) found that out of all measures of creativity only fluency has significant positive correlation with the mathematical creativity of the students in case of residential school students.

But contrary to the above results reporting high correlates between measures of creativity and achievement, Pathak (1961) demonstrated very low correlation. Flescher (1963) have even shown no relationship between achievement and creativity.
3.2 SOCIO-ECONOMIC STATUS, HOME ENVIRONMENT AND MATHEMATICAL CREATIVITY

Olive (1972) found that the ability of creative thinkers increase with the socio-economic status of the people.

Vijaya Lakshmi (1980) has also shown a positive relationship between creative ability and academic achievement. She found that high creatives were found from high socio-economic status group.

Singh (1977) by taking a random sample of 442 B.Ed. students of Lucknow City compared high and low creative groups in terms of value orientation, family background, age, sex, residence, religion and caste. The study revealed that high creative among student – teachers tended to go with higher economic value, better family background and urban living.

Joshi (1982) conducted a study with the aim to identify factors affecting the educational pursuit of the weaker section. According to the study, the problems in the way of
learning by children of the weaker section were below intelligence, poor comprehension and low educational level.

Kershner and Ledger (1985) in their study of the effect of style of thinking and sex of student’s creativity found that, sex and style of thinking had an effect on different dimensions of student’s creativity. They further suggested that performance on each of the creativity subsets may be strongly influenced by different and psychological and social class factors.

Pandey and Rai (1988) reported that urban students have a superior creative potential in comparison with rural students.

Kumari (1994) in her study also found the impact of socio-demographic factors on the creativity of the child.

It was observed from the results of Choudhary’s (1996) study that difference in the mean value of verbal fluency, flexibility and originality and social advantaged and disadvantaged secondary school students was significant at 0.01 level and the verbal fluency, flexibility and originality of
socially advantaged students were higher as compared to the verbal fluency, flexibility and originality of social disadvantaged students.

From the results of research study conducted by Rajnish (1998) it was observed that the variable of socio-economic status was found to be significantly positively correlated with the scientific creativity of the students at 0.05 level of significance.

Home environment refers all sorts of moral and ethical values and emotional, social and intellectual climate set up by the family members to contribute to the wholesome development.

Family with its physical, intellectual and emotional aspects shapes a child’s life in his journey towards self—fulfillment. Individual differences owe their origin mostly to a number of variables created by home which may hinder or help the progressive growth of a child.

In his study of creative people, Perkins (1981) found that they were able to produce great works, not
solely as a result of their talent, but as a function of their values and beliefs, demonstrated individually in terms of originality and independence. Fuerstein (1990) described it as crucial to the promotion of creativity.

A home may lack proper physical amenities, but that can be compensated through emotional attachment, intellectual richness and social competence whereas a home rich in physical amenities but lacking in warmth, concern and affection, may produce an individual devoid of any particular copying strategies for facing the reality of life.

Home factors are known to play a role in helping to identify the child at risk of becoming a creative (Pringle, 1970).

Terman had observed that the parents of the most successful men had encouraged initiative and independence (Coleman and Fults, 1982).

Misra (1986) found that home environment influences the development of scientific creativity. Similar findings were obtained by Paul (1987) and Kalra (1993). Gakhar
(1996) in his study revealed that physical, intellectual, social, emotional and psychological environment affects the achievement and learning of children especially in the field of science.

Verma and Kumari (1984) studied the role of home environment on the development of scientific creativity and found that the scores of scientific creativity were independent of the home environment and qualification of parents.

Raina (1986) found that socio-economic status of the students had no effect on their scientific creativity.

It was revealed in the study of Prakash (2000) that variable of socio-economic status is found to be significantly correlated with mathematical creativity of elementary school children at 0.05 level of significance. It was further revealed that variable of home environment is found to be significantly positively correlated with the criterion measure of mathematical creativity at 0.01 level of significance.

The above studies being indirect, inconclusive and limited, demand further research in field especially in the field of mathematical creativity.
3.3 HYPOTHESES

1. There will be significant relationship between the intelligence and mathematical creativity of the children.

2. There will be significant relationship between the creativity and mathematical creativity of the children.

3. There will be significant relationship between the mathematical achievement and mathematical creativity of the children.

4. There will be significant relationship between the socio-economic status and mathematical creativity of the children.

5. There will be significant relationship between the home environment and mathematical creativity of the children.

6. There will be significant relationship between the institutional environment and mathematical creativity of the children.
7. There will be no significant difference in the mathematical creativity of children with high and low socio-economic status.

8. There will be no significant difference in the mathematical creativity of children with rich and poor in home environment.

9. There will be no significant difference in the mathematical creativity of children with rich and poor institutional environment.

10. There will be no significant difference in the mathematical creativity of girls and boys.

11. There will be no significant difference in the mathematical creativity of urban and rural children.

12. There will be no significant difference in the mathematical creativity of children studying in public and traditional schools.