CHAPTER-III

REVIEW OF RELATED LITERATURE AND HYPOTHESES

In a bid to keep herself abreast of the work already done on the subject, to acquaint herself 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 thorough search of the literature from encyclopedias, research abstracts, theses, journals and books.

In the following pages, under various sub-headings 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.

3.1 ACADEMIC ACHIEVEMENT AND EMOTIONAL INTELLIGENCE

Elias et. al.(1991) in his study, “The promotion of social competence: Longitudinal study of a preventive school based program”, reported that teaching emotional intelligence is very important at school. Emotional intelligence influences academic achievement not only during the years they are taught, but also during the years that follow as well.

Ediger (1997) in his study, discovered that quality emotions and feelings help students to give their best potential in the classroom. The students who are aversive and think negatively cannot concentrate for a long time and have more difficulty in reaching their potential than others.
Pool (1997) in his study, “Up with emotional health”, reported that emotional intelligence is related with academic achievement.

Ohm (1998) in his study found a link between healthy emotional skills and academic achievement.

Finnegan (1998) in his study, “Measuring Emotional Intelligence: Where we are today”, discovered that emotional intelligence could lead to achievement from formal education years of child and adolescents to the adult’s competency being effectively in the work place and society

Tapia (1998) in his study, explored the relationship of emotional intelligence and academic achievement and found that there existed a low relationship between emotional intelligence and academic achievement.

Schutte et. al. (1998) reported women scores significantly higher than men on emotional intelligence scores.

Mayer (2000) also reported that women are slightly superior to men in perceiving emotions, integrating it in thought, understanding and managing it.

Miglani (2001) in his study, “Emotional intelligence as related to academic achievement of adolescents”, found a significant relationship between emotional intelligence and academic achievement.

Jaeger (2001) conducted a study on 150 students of public administration and revealed positive relationship between levels of emotional intelligence and academic performance.
Rajkhowa (2002) in his study, “Emotional Intelligence at work”, conducted a survey of 60 IAS officers and found that their emotional intelligence level was average.

Manhas (2004) in his study, “Cognitive and non-cognitive correlates”, concluded that adolescents’ academic achievement is positively and significantly related with their emotional intelligence. The value of coefficient of correlation between emotional intelligence and academic achievement was found to be 0.128, which was significant at 0.05 level.

Lekhi (2005) in her study, “A study of emotional maturity of adolescents in relation to cognitive and non-cognitive variables”, on a sample of 939 male and female adolescents found that variable of academic achievement has significant positive correlation with the emotional maturity. In other words, it was found that adolescents who were good in academic achievement were also very high in emotional intelligent which is one of the component of emotional maturity.

Singh (2006) in his study, “Academic achievement of college students in fine arts in relation to emotional intelligence, creativity, learning and thinking styles”, on a sample of 465 male and female B.A. Ill Fine Arts students, concluded that academic achievement of students in fine arts was found to be closely related to emotional intelligence of the students.

Nanda (2006) conducted a study on emotional intelligence in relation to academic achievement for urban adolescents and found positive and significant correlation between emotional intelligence and academic achievement for urban adolescents. The value of
correlation for different subjects including total academic achievement were highly positive.

3.2 ACADEMIC ACHIEVEMENT AND CREATIVITY

Since the publication of Getzel's Jackson (1962) study of relationship between creativity and academic achievement many studies have been conducted in this area. A large number of such studies in recent years including those of Getzel's Jackson (1962), Torrance (1962), Wallach and Kogan (1965), Israel (1971) have reported significant correlations between creativity and academic achievement. Yamamoto (1964) found that the relationship between creativity and academic achievement remain significant even after partialing out the effect of intelligence. The studies of Nuefeld (1964), Wallach and Kogan (1965), Cropley (1967) and Iwata (1968) have shown significant relationship between creativity and achievement. Passi's (1971) study aimed at exploring the relationship between creativity on the one hand and the variables of intelligence, scholastic achievement, sex and residential background on the other hand. The result of his study established a correlation of .385 between creativity and achievement. Joshi and Bajwa (1975) found no relationship of creativity with achievement in chemistry and mathematics. Gakhar and Wahi (1979) found that creativity and achievement were significantly positively correlated (r = .418).

In a study Raina (1968), Lalithamma (1975), Pandit (1976) and Mehdi (1977) found that creativity was positively and significantly correlated with academic achievement. Singh (1978) in order to find out the relationship between general and scientific creativity and intelligence and academic achievement of the
students in Science subjects found that urban students were found to be significantly better than semi-urban students in scientific creativity; general creativity and scientific creativity were positively and significantly related ($r = .79$), scientific creativity and academic achievement in the science subjects were positively and significantly correlated ($r = .42$), scientific creativity and intelligence were positively and significantly correlated ($r = .41$), general creativity and achievement in science subjects were positively and significantly correlated ($r = .35$).

**Gupta (1979)** on a sample of 100 students of VIII class found that creativity and academic achievement scores of the students were positively and significantly related ($r = 0.70$).

**Asha (1980)** designed a study to find out the relationship between creativity and academic achievement of high school students. The sample of the study consisted of 800 students of class X. Out of these 400 were males and 400 were females. The Wallach and Kogan’s tests of creative thinking were used to collect the data in respect of the creativity of the students and the achievement scores of the students were taken from the annual examination. The findings of the study revealed that there existed a positive and significant relationship between creativity and achievement scores of male as well as female students.

**Setia (1984)** in his study, “Intelligence, creativity and achievement in mathematics: a regression analysis”, revealed that the relationship between creativity and achievement in science was significant at 0.01 level of significance.

**Kalia (1985)** found that there was a significant relationship between science achievement and creativity components whereas
achievement in mathematics was positively and significantly related to only the originality component of creativity.

**Kershner and Ledger (1985)** found that the girls irrespective of their I.Q. level, thinking style scored higher than boys consistently across the seven creativity sub-scales, reaching statistical significance is verbal and figural fluency.

**Gakhar (1985)** in his study, “Intelligence, creativity and achievement in mathematics: a regression analysis”, found significant and positive correlation between mathematics achievement and measures of creativity.

**Raina (1986)** tried to study the comparative performance of boys and girls on the test of creativity using 180 subjects (90 males and 90 females) of VIII to X classes of Higher Secondary Schools of Ajmer. The results of this study showed that males were more creative than females on the figural test and on the parts of the verbal form.

**Yadav and Srivastva (1989)** conducted a study by taking a sample of 50 students of two high schools. They found that the academic achievement and creativity were highly correlated with each other.

**Thilagavathi (1990)** in his study, “Academic Achievement in relation to Intelligence, creativity and anxiety”, found positive and significant relationship between creativity and achievement.

**Patel (1992)** in his study, “An enquiry into the scholastic achievement in the context of intellectual ability, creativity, personality traits, family background and other personal variables of talent search scholars of Gujrat”, found significant relationship between measures of creativity and achievement.
Arora (1992) in her study, “Interactional effect of creativity and intelligence on emotional stability, personality, adjustment and academic achievement”, found positive and significant correlation between measures of creativity and academic achievement.

Kaur (1992) in her study, “Relationship among creativity, intelligence and academic achievement in different subjects of X grades”, found positive and significant correlation between measures of creativity and academic achievement.

Thampurathy (1995) in his study, “Socio-economic status of creative high achievers and creative low achievers in Mathematics”, selected 771 students of 9th class by stratified sampling technique. He found statistically significant mean difference between the creative high achievers and creative low achievers in their socio-economic status. He also observed that mean scores of parental income, occupation and education of creative high achievers were significantly higher than those of creative low achievers.

Pandhi (1995) studied the influence of creativity on academic achievement in different subjects. He found that relationship between measures of creativity was significantly related with achievement in English, Mathematics, Science and Social studies.

Kapoor (1996) in his study, “A study of creative thinking ability of high school pupils of Arunachal Pradesh in relation to their sex and academic achievement”, found that the mean scores of high and low achievers do not differ significantly on the variable of creativity.

Panda (1997) in his study, “Impact of creativity and adjustment on academic achievement”, found positive and
significant correlation between academic achievement and creativity.

*Bajwa (1998)* in his study, “A study of academic achievement in Physics in relation to intelligence, creativity and aptitude for physics at the senior secondary stage”, on a sample of 435 students of XI class found that all the measures of verbal and non verbal creativity except non verbal elaboration were positively and significantly correlated to academic achievement in Physics.

*Agarwal and Agarwal (1999)* in his study, “Creativity and Intelligence: exploration with sex difference”, intended to investigate the sex-difference in creativity of school going children from class VIth to class VIIIth from the city of Agra. Baqer Mehdi test was used. The findings indicated that boys were more creative than girls and there was significant difference between two groups.

*Prasad (2002)* in his study, “Intellective and Non-intellective factors associated with mathematical creativity at the elementary school stage”, on a sample of 540 students studying in VII class in the state of Himachal Pradesh found significant positive correlation between the variable of mathematical achievement and mathematical creativity at 0.01 level. He further found that there exists significant difference in mathematical creativity of children studying in public and traditional schools.

*Singh (2006)* in his study concluded that academic achievement of students were significantly related to creativity. He found that high creative students’ achievement was higher as compared to low creative students. He also concluded that originality measure of verbal creativity has significant relationship with academic achievement of the students in fine arts.
3.3 ACADEMIC ACHIEVEMENT AND LEARNING STYLES

Afif (1977) studied, “The effect of accommodating students’ learning styles on academic achievement and attitude towards algebra”. The results concluded that gender played a significant role in this study. Male students who were taught by the method of instruction corresponding to their learning style preferences had slightly higher attitudinal gain scores than male students who were taught by the traditional lecture method.

On the other hand, female students who were taught by methods of instruction that accommodated their learning style preferences had higher attitudinal gain scores and relatively no change in academic achievement. Additionally, analysis of data collected from male students revealed a significant negative relationship between male students’ academic achievement in algebra and the number of hours worked per week. In contrast, analysis of data collected from female students showed a significant positive relationship between female students’ academic achievement and number of hours worked per week.

Dani (1988) revealed that grade in mathematics and science courses correlated positively with measure of field independence.

Verma and Kumari (1988) conducted a study on learning style preferences of senior secondary students in relation to their sex. The sample of 105 male and 105 female students were randomly selected for the study. The results of the study indicated that male students differed significantly with female students with regard to their preferences for individualistic vs. non-individualistic learning style. Female students showed
relatively more liking for environment oriented learning style in comparison to male students.

Joy (1991) in his study, “An investigation of the impact of learning style factors on college student’s retention and achievement”, investigated the impact of learning style factors on college students’ retention and achievement. The purpose was to determine the effect of exposure to different level of learning styles information on the academic achievement and retention rate of full time college students. The results of the study established no significant impact of learning style factor on college student’s achievement. The same results were reported by Burkey (1993).

Setia (1991) conducted a study on a sample of 510 students and explored the effect of some socio-psychological and educational factors of differential learning rate in modern mathematics. She revealed that male rapid learners perform better on achievement tests in mathematics as compared to female rapid learners. However, male-female average and slow learners do not differ significantly with each other on achievement in mathematics.

Susabda (1992) reported that learning style of the average and below average students tended to be more concretely dimensional while superior students tended to be more abstract in their thinking.

Key (1993) in his study, “Gender differences in attitude special visualization ability and learning styles of remedial mathematics students”, studied gender difference in learning style of remedial mathematics students. The findings revealed that males scored significantly higher on reflective observation mode of learning style.
William (1994) investigated in his study, “The relationships among elements of learning style, mode of instruction and academic achievement”, found that the Productivity Environmental Preference Survey (PEPS) was used to assess the preferred learning style of subjects. Six PEPS learning style elements (kinesthetic preferences, need mobility, late morning, evening / morning, afternoon and tactile preferences) were found to significantly contribute to the model. The conclusion obtained that late morning, evening / morning, afternoon and tactile preferences had positive correlation implying that the higher the preference for these learning style elements, the higher the achievement score. Conversely, kinesthetic preferences and needs mobility resulted in a negative correlation implying that the higher the preference for these learning style elements, the lower the achievement scores.

Goodwin (1995) in his study, “Effects of matching student and instructor learning styles preferences on academic achievement in English”, indicated that the students taught by instruction that matched their preferred learning style, had significant gains in academic achievement.

Significant high achievement resulted, among previously failing students when they were taught with strategies that complemented their learning style preferences.

Verma and Sharma (2000) in his study, “Academic achievement in relation to learning styles of adolescents”, conducted a study on 120 adolescents of IX class of Bharatpur city with the objectives to compare the academic achievement of adolescents students possessing independent and dependent learning styles in respect of Hindi, English, Mathematics, General Science, Social studies and total area of study. It was found that
the group of dependent learning styles students was significantly better than the group of independent learning styles students so far achievement in social studies was concerned. There was no significant difference between mean scores of achievement in Hindi, English, Mathematics, General Science, Social Studies and total area of study in respect of competitive and collaborative learning style groups.

Jones (2000) in his study, “Are learning styles subjects area sensitive?”, reported that there were statistical significant difference in students learning preferences by academic achievement.

Srivastava (2002) in her study entitled “A study of learning style of secondary school students with scientific attitude and their achievement in science” found that most popular learning style of the students is accommodating learning style and second popular style is convergent. The study also revealed that students following convergent learning style scored better in science than the students following other learning styles. Also a student learning style and their intelligence was related with each other. Study also showed difference in learning styles of boys and girls. Most of the girls preferred convergent and accommodative learning styles and very few girls prefer divergent and assimilative learning styles whereas all the four learning styles were preferred by almost equal number of boys.

Singh (2006) in his study found that there was no significant relationship between learning styles and academic achievement of students in fine arts. In other words, academic achievement in fine arts was insignificant with right hemisphere and left hemisphere
measures of learning styles. Thus right and left hemispheric have no association with academic achievement of students in fine arts.

3.4 ACADEMIC ACHIEVEMENT AND MATHEMATICAL APTITUDE

Deshpande (1967) studied in his investigation “Prediction of a predictive battery of tests of aptitude for science for boys of secondary schools” that there was positive correlation i.e. 0.72 between scientific aptitude and achievement of the students in science.

Mathur (1971) in his study, “Predictive validity of some psychological factors for success in science courses” made an attempt to explore the correlation of intelligence, aptitude and interest with achievement in science and mathematics group students. He revealed that the test viz. mechanical comprehension, space relation and interest inventory were valid predictors of achievement in the subject life science and mathematics.

Ghuman (1976) in his study, “A study of aptitudes and personality traits of under achievers” conducted a sample of 1948 students of both sexes in Madhya Pradesh. He found that over achievers and under achievers did not differ significantly in their aptitude.

Pandey (1980) took a sample of 1900 boys and girls studying in class IX and X of the secondary schools of Bihar. The findings of the study were: (i) The distribution of mathematical aptitude test scores of secondary school boys and girls were almost normally distributed. (ii) The urban boys scored significantly higher in mathematical aptitude than their counterparts. (iii) Urban girls were superior to their counterparts in mathematical aptitude. (iv)
Mathematical aptitude test scores had significant correlation with the examination marks in mathematics. Mathematical aptitude test was significantly positively correlated with the general scholastic achievement as measured by school examination in terms of aggregate marks.

**Kumar (1985)** in her study, “Achievement in science subjects in relation to scientific aptitude” tried to find out the difference in scientific aptitude and relationship between achievement in science subjects and scientific aptitude. Results of the study were: aptitude in science and achievement in science was positively related; students with high aptitude in science were found to achieve high in science; students with low aptitude in science were found to achieve low in science.

**Khatoon (1988)** in his study, “A study of mathematical aptitude among boys and girls and its relationship with interests and vocational preferences at the secondary school level” had studied the relationship of mathematical aptitude among boys and girls with interest and vocational preferences. He found significant difference in the aptitude for mathematics among boys and girls. Further, he found that there was a significant difference in their achievement. Vocational preferences were influenced by environmental factors like occupation of father. In general, boys preferred vocations related to mathematics.

**Diwan (1991)** in his study, “A study of predictors of academic achievement of student teachers in terms of aptitude, attitude, participation and human values” found positive and significant relationship between academic achievement and aptitude.
Tucker (1991) in his study, “A retrospective study of aptitudes, behaviours, intelligence and achievement pattern for three groups of special educator students” found positive and significant relationship between aptitude and achievement.

Moore (1994) in his study, “Competency and aptitude factors as predictors of success of provisionally admitted college freshmen” found no relation between academic achievement and aptitude.

Sharma (1995) in his study, “A study of some important aptitudes of over and under achievers of class X students” studied some important aptitude of over and under achievers of X class students and found that over achievers excelled significantly in scientific aptitude than under achievers, whereas under achievers excelled significantly on numerical ability, reasoning aptitude and verbal aptitude than over achievers.

Singh (2004) in her study, “A study of the impact of scientific aptitude and study habits on the achievement of XI grade students in science” framed the following objectives:

(i) To compare the scientific aptitude of male and female students
(ii) To compare the scientific aptitude of rural and urban students.
(iii) To compare the scientific achievement of male and female students.
(iv) To compare the scientific achievement of rural and urban students.
(v) To study the relationship of scientific aptitude and achievement of students in science. The major findings of the study were:

(i) Males had significantly higher scientific aptitude than female at 0.05 level of significance.
(ii) Urban and rural group of students differed significantly at 0.01 level. Urban students had more positive scientific aptitude than rural students.
(iii) Female scored high in the subject of science,
but there was no significant difference in male and female group of students at any level. (iv) Urban students had significant high achievement in science than rural students at 0.01 level of significance. (v) The coefficient of correlation of scientific aptitude with achievement in science was 0.61, which was positive, high and significant at 0.01 level of significance.

Rajni (2006) in her study, “Teacher- Parental support study habits, aptitude for and attitude towards mathematics as predictors of mathematical achievement”, concluded that there was significant correlation between mathematics aptitude and achievement in mathematics at 0.01 level of significance.

It is important to note that difference between males and females in spatial ability is relatively small. Even if definitive evidence of a biological basis for sex difference in spatial abilities were established, it would not mean that these difference are not culturally influenced or modifiable (Petersen and Gitelson, 1984), it has been suggested that boys are encouraged more often to play with toys such as models or motors that involve spatial abilities (Sherman, 1980) and are encouraged in mathematical and scientific endeavour (Kimball, 1989). Moreover, parents believe that boys are better in mathematical and girls in reading. Nor is the effect limited to the United States; similar differences were found in Taiwan and Japan (Lummis and Stevenson, 1990). Whatever that reason may be, girls enroll in increasingly fewer mathematics and science courses over the high school and college years, and it becomes more difficult to develop interest of even girls with superior mathematical aptitude to remain involved in the subject (Eccles, 1985). For example, in a study of California schools between 1983 and 1987, girls made up only about 38
percent of physics classes, 34 percent of advanced physics classes, and 42 percent of chemistry classes (Hyde and Linn, 1991). However, a national study involving over 400,000 children compared the cognitive skills of high school children in 1960 and 1975 and found a great improvement in the mechanical and spatial performance of girls (Flannagan 1978). Other suggest that the gap is continuing to lessen (Feingold, 1988; Hyde et al., 1991), which may mean that changing gender-role standards are having some effects on the cognitive interests and aptitude of girls.

**Academic Achievement and type of school, sex differences**

Thakur (1972), Lalithama (1975) found positive significant sex difference in respect of mathematical achievement and concluded that males are high achievers than females in mathematics.

Sharma (1976) found that mathematics achievement had significant positive correlation with intelligence and girls had higher mathematics achievement than boys.

Gakhar (1984) in his study investigated the effect of five types of schools namely government boys, government girls, coeducational, private boys and private coeducational on the acquisition of mathematical concepts by the students of middle standards. In his study he concluded that mathematical achievement of private boys schools was higher than the performance of students of other types of schools. Similarly, the mathematical achievement of private co-educational schools was superior to the performance of students studying in all other three types of government schools.
Verma (1996) in his study on 113 students studying in XI class in three types of school-convent, sainik and government schools of Ajmer (Rajasthan) concluded that adolescents studying in these schools differ significantly in their learning styles and academic achievement.

3.5 HYPOTHESES

The following hypotheses were framed in the present investigation:

1. There will be no significant relationship between emotional intelligence and achievement of students in mathematics.

2. There will be no significant relationship between creativity and achievement of students in mathematics.

3. There will be no significant relationship between the learning styles and achievement of students in mathematics.

4. There will be no significant relationship between mathematical aptitude and achievement of students in mathematics.

5. (a) There will be no significant difference in the achievement of students in mathematics due to high and low level of emotional intelligence.

(b) There will be no significant difference in the achievement of students in mathematics due to high and low level of creativity.

(c) There will be no significant difference in the achievement of students in mathematics due to high and low level of mathematical aptitude.
6(a) There will be no significant difference in the emotional intelligence of male and female students.

(b) There will be no significant difference in the emotional intelligence of government and private school students.

7(a) There will be no significant difference in creativity of male and female students.

(b) There will be no significant difference in creativity of government and private school students.

8(a) There will be no significant difference in mathematical aptitude of male and female students.

(b) There will be no significant difference in mathematical aptitude of government and private school students.