CHAPTER II

REVIEW OF RELATED STUDIES

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Studies related to Achievement Motivation and Academic Achievement
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CHAPTER II

REVIEW OF RELATED STUDIES

A systematic canvass of the related studies is the means of determining whether the proposed study unnecessarily duplicates some earlier investigation. The knowledge secured from such reading in terms of sources, procedures and results represents essential orientation for definition of the problem, selection of method and interpretation of findings.

The review of related studies has been conducted including the four experimental variables, viz., Intelligence, Scientific Creativity, Achievement Motivation and Home Environment as related to Academic Achievement and their interrelations.

The review of related studies are organised under the following heads:

2.1. Studies related to Intelligence, Creativity and Academic Achievement
2.2. Studies related to Achievement Motivation and Academic Achievement
2.3. Studies related to Home Environment and Academic Achievement
2.4. Studies related to Intelligence, Creativity and Achievement Motivation
2.5. Studies related to Intelligence, Creativity and Home Environment
2.6. Studies related to Scientific Creativity
2.1 STUDIES RELATED TO INTELLIGENCE, CREATIVITY AND ACADEMIC ACHIEVEMENT

Achievement of an individual depends to a great extent on his intellectual characteristics and the creative abilities. The following studies revealed the relationship between Intelligence, Creativity and Achievement.

Wright (1985) conducted a factor analytic study of intelligence and achievement. Scores in the Wechsler Intelligence Scale for Children (Revised) and the Wide Range Achievement Test were collected from 160 children (9-12 years). The four factors identified were verbal comprehension, numerical, written language and performance. The results indicated a functional overlap of the variables studied.

Brar (1986) found the influence of intelligence was significant on the performance of students. It was also found that high creative girls and low creative girls scored higher than high creative boys and low creative boys respectively.

Olesky-Ojikutu (1986) found that intelligence had a significant positive correlation with all the five creativity sub-scores.

Sumangafa (1986) found that there was significant relationship between creativity and verbal intelligence, and between creativity and non-verbal intelligence.

Nair (1987) found that certain cognitive variables, namely verbal classification, proverbs, verbal intelligence, non-verbal intelligence and
number series differed between high creative underachievers and low creative underachievers.

Trimurthy (1987) found that students with high I.Q. were more creative than students with low I.Q. in verbal Creative Thinking Ability (CTA).

Gakhar, Paramjit and Pushpa (1989) found that there was significant difference in fluency, flexibility and total creativity among students of high, average and low intelligence groups and there was no significant difference in originality among students of high, average and low intelligence groups.

Patel (1990) found that there was significant, positive but low correlation between creativity and two groups of intellectuals.

Gill (1991) found that high intelligent subjects scores higher on originality than low intelligent subjects irrespective of training strategies, whereas fluency, flexibility and creative problem solving skill totals were not affected by levels of intelligence.

Jaswal and Jerath (1991) found that for pupils in the high intelligence group, there was no significant correlation between intelligence and creativity. For pupils in the low intelligence group, intelligence was related to verbal and total creativity but not to figural creativity.

Sreekala (1991) found that the relation between intelligence, creativity and achievement was significant.

Srivastava and Thomas (1991) found that there was positive relationship between intelligence and creativity.
Narramore (1992) found that low correlation existed between creativity and intelligence.

Ajitha (1992) explored the association between creativity, intelligence and achievement in English. The study showed that (i) the relationship between creativity and achievement was significant \( r = 0.2216 \) for whole sample.

Raj (1994) concluded that there was positive correlation among the variables, viz., fluency, flexibility, originality and verbal and non-verbal intelligence. The range of correlation between variables of creativity, on the one hand, and the variables of intelligence, on the other, was between +0.219 and +0.287.

George (1994) made a study of the mathematical creativity of secondary school pupils in relation to their intelligence and mathematics achievement. The study showed that mathematical creativity was significantly correlated with intelligence and mathematics achievement.

Pillai and Kumar (1996) designed a study to find out the magnitude of direct, indirect and casual relationship of intelligence, cognitive style and approaches to studying on achievement in Biology of Standard IX pupils. They found that among the three variables, intelligence shows the maximum total effect on achievement in secondary school Biology.

Jayalekshmi (2000) found a significant correlation between achievement in problem solving in science and intelligence \( r = 0.627 \).
Sabeena (2000) reported that there was positive and significant relation between verbal comprehension, numerical reasoning, spatial ability and achievement in Chemistry.

George (2000) conducted a study on correlates of mathematical creativity. The study showed that (i) there was positive and significant relationship between verbal mathematical creativity and verbal intelligence \((r = 0.4797)\); (ii) there was positive and significant relationship between non-verbal mathematical creativity and non-verbal intelligence \((r = 0.5953)\).

Kumari (2002) conducted a study on the effect of verbal and non-verbal intelligence on process outcomes in science of secondary school children. The study found that verbal intelligence, non-verbal intelligence and total intelligence were closely related with process outcomes in science.

### 2.2 STUDIES RELATED TO ACHIEVEMENT MOTIVATION AND ACADEMIC ACHIEVEMENT

Ahluwalia (1985) found a significant and positive relationship between achievement motivation and scholastic performance.

Raghava (1985) conducted a study of achievement motivation development in the pupils of ninth standard with various socio-economic levels and arrived at the following conclusions:

(i) The achievement motivation development course resulted in a positive gain in the immediate performance of pupils;

(ii) The training course resulted in improved achievement at the S.S.L.C. examination;
Ghoash (1985) studied the achievement of the students in Chemistry and investigated the determinants of achievement in Chemistry. He found that there was a positive correlation between the scores in Achievement Test in Chemistry and Achievement Motivation Test.

Geetha (1985) found a significant relationship between Achievement Motivation and Biology Achievement.

Natesan and Seeta (1986) conducted a study to find the relationship between achievement motivation and achievement. A sample of 60 students, 30 high achievers and 30 low achievers from Standard XII was selected. The results showed that (i) the high achievers have high achievement motivation scores when compared to the low achievers; (ii) the critical ratio revealed that there was significant difference between high achievers and low achievers with regard to need for achievement scores; (iii) there was significant positive correlation between achievement motivation and academic achievement.

Oliver and Simpson (1988) found that effective behaviour in classroom are strongly related to achievement and the effective constructs like motivation, interests, etc., could be successfully used to predict achievement.

Snodgrass (1989) found significant positive correlation between achievement motivation and grade point average.

Biggs (1989) studied the relationship of achievement motivation and achievement of emotionally and behaviourally handicapped children. The study found that controlling intelligence, there was no significant relationship between achievement motivation and achievement.
Lee's (1989) study showed that there existed positive correlation between achievement motivation and achievement in science.

Suciat (1990) studied the effect of motivation on academic achievement in a distance education setting. The concept of motivation was measured by three factors: academic self-concept expectancy and value of success. The study showed a positive and significant relationship between motivation and achievement.

John (1991) investigated the effects of a specific goal setting procedure on three dependent variables, achievement, perception of self-efficacy and goal setting accuracy. There were three experimental groups. Students in the goal setting conference group were hypothesised to show higher academic achievement. The students of this group showed statistically significant higher achievement.

Wang (1991) studied the relationship between achievement motivation, goal acceptance and goal difficulty on task performance. The study used Locke's goal setting theory and Atkinson's achievement motivation theory to examine the effects of achievement motivation. Effect of achievement motivation on task performance was significant.

Yeh (1991) conducted a study to find out the relationship of academic achievement to the variables of achievement motivation, study habits and intellectual development. The important finding of the study was that a weak but positive correlation was found between achievement motivation and academic achievement.
Lewis (1991) found that achievement motivation influenced academic achievement positively.

Sundararajan and Gnana Guru (1992) found that there was no significant relationship between achievement motivation and achievement.

Wolf (1993) examined the effects of anxiety and motivation on test performance. The study showed that motivation to perform on a test is directly influenced by the consequence of the level of performance.

Gardner (1993) studied the relationship between self-esteem and academic motivation for higher education and he analysed the perception and expectations of students relating to significant others in their roles as motivators of students for academic achievement. The results showed significant relationship between motivation and academic achievement.

Neibur (1994) found that there is significant relationship between school-student academic orientation, intrinsic motivation and grade point average.

Manijeh's (1994) study showed that there was significant relationship between children's Academic Intrinsic Motivation Inventory scores and children's school grades.

Abouserle (1995) showed that students' personality trait in general and their self-esteem and achievement motivation in particular have substantial influence on their approaches to study and levels of knowledge processing.

Eppler and Harju (1997) compared traditional and non-traditional college students with respect to their learning goals and achievement goal
and found that the group differed inversely on variables related to achievement.

Jayalekshmi (2000) conducted a study of achievement facilitating variables affecting the problem solving ability of girls in higher secondary schools of Kerala. The coefficient of correlation between achievement motivation and achievement was found to be significant for the total sample ($r = 0.577$), rural ($r = 0.432$), urban ($r = 0.579$), government ($r = 0.527$) and private (0.72). All these relationships were significant at 0.01 level.

Lan (2002) found that motivational forces enhanced achievement and they were the strongest predictors of student’s commitment to science.

Riley (2002) conducted a study on elementary school students’ academic motivation. The study found that teacher’s perception of students’ motivation was mediated by student performance.

Nancy (2003) conducted a study on the degree of association between achievement motivation and cognitive ability in chemistry of high school students. The study revealed that for the whole sample, the relationship between n-ach and cognitive ability was significant at 0.01 level. In the case of subsamples for girls, the relationship was significant at 0.05 level.

### 2.3 STUDIES RELATED TO HOME ENVIRONMENT AND ACADEMIC ACHIEVEMENT

The parent is the first teacher and the teacher is the second parent. The role of parents and family in the development of cognitive abilities and social competence in children has been well proved. The researches
reported here seek to identify those aspects of family environment which deeply influence student's achievement.

Jagannadhan (1986) has studied on home environment and academic achievement. The result showed that home environment has got strong association with academic achievement. In the prediction of academic achievement, home environment of children played a significant role.

Soto (1986) examined the difference in the home environment between high achieving and low achieving children. Statistical analyses revealed significant differences in home environment between high and low achieving students.

Ekeoha (1986) found that home environment is an important correlate of achievement in science. Analysis of the home background component variables indicated that possession of books in the home had a significant effect on achievement in science.

Pillai (1987) found that greater number of underachievers were associated with large family.

Lethakumari (1987) conducted a study on the environmental factors and achievement in social science. It was found that the group under study differ significantly with respect to family climate. A significant proportion (76%) of the high achievers had happy parental relationship. The high and low achievers under study differ significantly with respect to adequacy of facilities for learning. Here also, 80% of the high achievers had adequate facilities for learning.
Topper (1989) examined the relationship between the levels of parental environment in a pilot program entitled parents and children together. The study suggested that there was a relationship between parental involvement and child’s academic achievement.

Chaman (1990) studied the impact of parent child relation on achievement of pre-degree students. She found that there was no significant relationship between parent child relations and achievement. The high and low achievers were identical with respect to their relationship to parents.

Harris (1991) in his study showed that parent involvement in academic home work and academic achievement were not significantly correlated.

Sanchez (1991) has studied parental support and academic achievement. The study showed that academic achievement was a combination of student ability, parent beliefs, and parent support for education.

Blanchard (1991) in his study showed that within the home setting of low socio-economic African American families, boys and girls were not provided with good support by their parents for academic achievement.

Lee’s (1991) study showed that home environment and educational achievement had low correlation.

Srivastava (1991) found that families of high achievers were more structured and organised and they exercised more controls and had a set of rules and procedures to be followed by its members.
Marope (1992) has studied the determinants of academic achievement and found that home support was an important factor that determines achievement.

Ajitha (1992) showed that the relationship between home environment and achievement was negligible. For the whole sample, the relation between home environment and achievement was negative but for three subsamples, rural government and private the relation was significant.

Keating (1992) found that there was a positive relationship between family income level and student’s science grades.

Youn’s (1993) study investigated the relationship between home environment, self-efficacy and academic achievement of 89 Asian American students. The study showed that family income and self efficacy were positively related with academic achievement.

Robinson (1994) has studied the effect of certain selected variables on achievement. Analysis of the data indicated significant relationships between achievement scores and the predictor variables of family type and date of birth.

Barker (1994) conducted a study on selected factors related to academic achievement of developmental introductory algebra students at the two year college level. The study revealed that there was a significant relationship between the annual income and academic achievement and also the percent of college expenses paid by the employer on academic achievement.
Rekha (1994) conducted a study to examine the relationship between home environment and achievement in science of lower primary school. The results showed that

(i) Parental involvement and parental help to solve doubts were factors that determine the achievement in science;

(ii) Home learning facility, availability of books, parental discussion on educational problems of children and parental attention to educational problems of children were not factors that determine the achievement in science.

Sayfried (1994) studied the factors associated with academic success of students and the data showed that the family environment had no direct or indirect effect on grade point average.

Al Shahany (1995) explored the relationship of selected variables to biology achievement of secondary school students. The results of the study revealed that student antecedent variables namely home environment and prior knowledge seemed to correlate highly with biology achievement.

Reju (1997) conducted a study on achievement in science as related to science attitude, science interest and home learning facility of upper primary school pupils. The major finding of the study showed that achievement in science and home learning facility was not significantly related.

Jacob (1998) conducted a study on selected variables associated with achievement in chemistry of vocational higher secondary school students. The findings of the study were as follows:
The coefficient of correlation between home environment and achievement in chemistry for the total sample ($r = 0.509$), boys ($r = 0.465$), girls ($r = 0.468$), rural ($r = 0.487$), urban ($r = 0.531$), government ($r = 0.716$) and private ($r 0.364$). All the obtained relationships were positive and significant which proved that home environment and achievement in science was closely associated.

Smith and Hausafus (1998) found the relationship of family support and ethnic minority students' achievement in science and mathematics. The study found that family support was strongly associated with science and mathematics achievement.

Mashile (1999) has studied the psychological and social factors related to physical achievement in science and attitude of secondary school students. The results of the study indicated that home environment and motivation had the greatest total contributions to physical achievement in science.

Heastie (2001) conducted a study of the relationships and difference on self-regulated learning, parental involvement in home work and academic achievement among high school students in Rural West Virginia. The study found that there was no statistically significant positive relationship between parental involvement and academic achievement.

Antony (2003) found that Family Climate and Academic Achievement were significantly correlated. For the total sample, the coefficient of correlation obtained was 0.674.
Netto (2004) in his study on Influence of Home Environment and Achievement Motivation on Academic Achievement of Fishermen Students at Higher Secondary Level found that Home Environment and Achievement Motivation were highly influencing variables of Academic achievement.

2.4 STUDIES RELATED TO INTELLIGENCE, CREATIVITY AND ACHIEVEMENT MOTIVATION

Sujatha and Yasodhara (1986) in a comparative study of some educational variables of ST/SC students, found that SC/ST students were low in their academic achievement and achievement motivation. Achievement motivation and socio-economic status were found to be independent of each other. Significant relationship was found between achievement motivation and type of school.

Tripati's (1986) study on achievement motivation found that achievement motivation of boys and girls was highly correlated with intelligence.

Fatmi (1986) found that social background, sex, religious background and caste status influenced achievement motivation. The area of residence and socio-economic status were important determinants of achievement motivation. Family type had little to do and ordinal position had almost nothing to do with achievement motivation.

Rajagopalan's (1988) study on creativity and achievement motivation showed that there was a significant positive correlation between achievement
motivation and creativity. It was concluded that classroom climate and intelligence had significant effect on creativity scores.

Archer's (1990) study showed that there was significant relationship between achievement motivation and creativity.

Johnkutty (1990) found that one among the personality variables which discriminate between high creative and low creative pair was achievement motivation. The other variables were social adjustment, personal adjustment, general anxiety, examination anxiety, school relations, social standards, community relations, family relations, social skills, self-reliance and sense of personal freedom.

Petrick (2002) in the study on early adolescents motivation during science investigation examined evidences of students motivational beliefs and goal orientation. Achievement Motivation appeared most strongly related to increased understanding of Science.

Hancock (2003) in the study on Co-operative Learning and Peer Orientation Effects on Motivation and Achievement found that the students with high peer orientation were significantly more motivated to learn than students with low peer orientation.

Joseph (2004) in his study on Relationship of Achievement Motivation and Level of Aspiration with Achievement in Social Science found that both the variables, Achievement Motivation and Level of Aspiration have significant effect on Academic Achievement.
Ambily (2005) in the study on relationship of Creativity and Intelligence with reading Comprehension in English found that Creativity and Intelligence were significantly related to reading comprehension in English.

Sindhu (2005) in the study of relationship among creativity, Classroom Adjustment and Academic Achievement of Students at Higher Secondary Level found that Creativity and Achievement were closely related variables.

2.5 STUDIES RELATED TO INTELLIGENCE, CREATIVITY AND HOME ENVIRONMENT

Bharadwaj (1985) reported that age, sex and intelligence affected the creativity components and that the discerned facts would provide a better future in the domain of creativity along with better guidelines to the adolescent’s future perspectives.

Brar (1986) found that high-creative girls and low-creative girls scored higher than high creative boys and low creative boys respectively. It was also found that the influence of intelligence and socio-economic status on the performance of students was significant.

Nair (1987) in a comparative study of certain cognitive, affective and social variables which discriminate between high and low creative underachievers in secondary school science, found that the following familial variables are capable of discriminating the different groups of creative subjects.

(i) Father’s educational and family cultural level
(ii) Family environment
(iii) SES, father's income level, father's occupational level and family acceptance of education.

Moni (1990) found that variables like family income level, family occupation level and socio-economic status were capable enough to discriminate between high creative and low creative pupils.

Kamaini (1991) found that those children who lived with their families scored more in creative assessment. The unfavourable, depressed and non-stimulating conditions of the home for the destitute children inhibited their creative potentiality.

Srivastava and Thomas (1991) conducted a study of the effect of sex, age, birth order and intelligence on creativity of pre-school children. There was a positive relationship among intelligence and creativity and also the birth order was found to be positively correlated with creative ability. As the children grew older, it was observed, their creative ability also increased, based on the opportunities and facilities available.

Biller (1993) conducted a study on the impact of parental involvement in child development, intelligence and creativity. The study supported the view that the fathers have a significant role in the proper development of intelligence and creativity of children.

Renzulli (1995) found that the parents have a crucial role in stimulating children's creativity and intelligence.
Jyothimol (2003) in the study on the relationship among home learning environment, classroom learning environment and creativity found that home learning environment and creativity were closely associated variables.

### 2.6 STUDIES RELATED TO SCIENTIFIC CREATIVITY

Yawalkar (1985) investigated a study on development of some personality correlates of scientific creativity. The study was aimed at investigating the efficiency of two creative teaching techniques, viz., bionics and morphological correlates analysis conducive to develop some personality correlates of scientific creativity. The personality variables under study were (i) self-reliance, (ii) dominance, (iii) emotional stability, (iv) venturesome, (v) super ego strength.

Misra (1986) conducted a study on effect of home and school environments on scientific creativity. The major findings showed that boys do not differ significantly from girls with respect to inquisitiveness which is an aspect of scientific creativity. However, girls excel boys in three aspects, viz., fluency, flexibility and originality. All the significant relations among the variables seemed to be tied with verbal intelligence, non-verbal intelligence and socio-economic status.

Sukla and Sharma (1987) administered a Scientific Creativity Scale in 330 urban, rural and refugee students in the middle school to test for fluency, flexibility and originality. The results indicated that the lowest scores came from tribal pupils and rural pupils scored higher in fluency than the refugees.
Baby (1989) found that relation between science learning environment and divergent thinking in science was positive. There was no significant difference based on sex in the relation between science learning environment and divergent thinking in science.

There was significant difference for the rural urban subsample when the science learning environment and divergent thinking in science were correlated.

Gregor (1991) conducted a study to understand creativity, creative personality and the productively creative scientist. Attempt was to understand and utilise personality measures which are valid and effective, for identifying, significantly predicting and selecting creative talent.

Anilkumar (1992) studied the relationship between creativity in science and certain demographic variables of secondary school pupils. The study showed that there exists a significant relationship between each of the component of creativity in science and total creativity in science with each of the demographic variables, viz., sex, locale and socio-economic status.

Asmali (1994) conducted a study to find out the relationship between achievement in science, science interest, scientific attitude, process outcomes in science and scientific creativity of secondary school pupils. The correlation coefficient of achievement in science and scientific creativity was found to be 0.3012 (total), 0.2781 (boys), 0.3227 (girls), 0.3740 (rural) and 0.2195 (urban). For all samples, the coefficients were significant at 0.01 level.

Sansanwal and Deepika (1997) found that
(i) male and female students did not differ significantly in scientific creativity;

(ii) Interaction between standard and sex did not have any significant influence on scientific creativity; and

(iii) Scientific creativity scores of students belonging to high and low levels of intelligence did not differ significantly.

Sreejaya (1998) conducted a study on scientific creativity in relation to intelligence of degree students. The major objectives were (i) to estimate the degree of association between scientific creativity and intelligence; (ii) to estimate the degree of association between each of the components of scientific creativity and the four components of intelligence; (iii) to compare the three intelligence pairs (H-A, A-L, H-I).

The coefficient of correlation between scientific creativity and intelligence was found to be 0.7035 (total), 0.2987 (boys), 0.2832 (girls), 0.5984 (rural), 0.6219 (urban), 0.6668 (physics optional group), 0.3630 (chemistry optional group), 0.3901 (zoology optional group) and 0.4330 (botany optional group). For all samples, the coefficients were significant at 0.01 level.

Haneeshia (2001) conducted a comparative study of scientific creativity of pupils in DPEP and non-DPEP schools in the State of Kerala. The study found that the two groups differ significantly with respect to fluency (CR = 4.27), flexibility (CR = 2.02), originality (CR = 2.07) and total creativity (CR = 4.56).
2.7 MAJOR TRENDS INDICATED BY THE REVIEW

The review of studies mentioned so far, gives a perspective of the empirical works done in the area. The major implications derived from the related studies are presented below.

(i) Most of the studies in achievement in science have been conducted in relation to cognitive variables. Studies showing the combined effect of cognitive, affective and familial variables are very few;

(ii) Studies on achievement in science in relation to scientific creativity and intelligence are very rare;

(iii) A vast majority of the reported studies on achievement have been done in relation to intelligence and general creativity. Achievement in science and scientific creativity has not correlated by considering the effects of other affective and social variables;

(iv) Many studies explored the relationship between achievement and home environment. The family variables like dependence-independence, birth order, family size, etc. have been studied by western researchers. Home environment has been studied by analysing the physical environment of the home. Many emotional factors of the home which are significant for the achievement of an adolescent student has not been considered in earlier studies;

(v) Scientific creativity with its components, viz., fluency, flexibility and originality and verbal and non-verbal forms of intelligence and
scientific creativity correlating with achievement in science have not been studied earlier;

(vi) The review of above-mentioned studies does not enable to draw a generalised conclusion regarding the effect of achievement in science related variables. Some of the studies show a significant relationship between the selected variables whereas some studies clearly indicate that the relationship is not significant.

The review of related studies provides supporting evidences for the present study by revealing the results of those works. Simultaneously, the drawbacks observed stimulate the investigator for a more systematic and adequate study in the above field.