CHAPTER II: REVIEW OF RELATED LITERATURE
CHAPTER-II

REVIEW OF RELATED LITERATURE

2.1 NEED FOR THE REVIEW OF RELATED LITERATURE

Everyday knowledge is growing rapidly. Many scholars, researchers and writers keep on adding new knowledge to the existing one through their studies and writings. There is a tremendous increase in the number of periodicals in developed and developing countries. One who is not fully conversant with what has gone before has little chance of making a worthwhile contribution. Therefore a researcher has to survey the available literature relating to his field of study. One must keep himself update in his field and related areas.

According to Fox J. David, review of literature serves the following five purposes;

1. The conceptual frame of reference for contemplated research.
2. An understanding of the status of research in the problem area.
3. Clues to the research approach, method, instrumentation and data analysis.
4. An estimate of probability of success of contemplated research and the significance or usefulness of the findings and assuming the decision is made to continue.
5. Specific information needed to state the definitions assumptions, limitations and hypotheses of the research.

In addition to the above mentioned purposes, research review also serves the following purposes and they are:

- to gain a background knowledge of the research topic.
- to identify the concepts related to it, potential relationships between them and to formulate researchable hypotheses.
- to identify appropriate methodology, research design, methods of measuring concepts and techniques of analysis.
- to identify data sources used by other researchers.
- to learn how others structure their reports.
- to gain up-to-date knowledge in the field.
- to know the work already done on the area.
- to identify the research gaps in the field.
- to avoid duplication.
- to develop alternative designs.
- to take notes and compile bibliography.
- to define the limits of the research study.
- to state the objectives clearly and concisely.

For the present study, the following studies have been reviewed and presented in an order.
2.2 STUDIES RELATED TO CRITICAL THINKING AND ACADEMIC ACHIEVEMENT:

He Yunfeng (2007) has studied "The role of thinking styles in learning and achievement among Chinese University students."

The present research examines the role of thinking styles in learning and achievement among Chinese University students. It is based on Sternberg's theory of mental self-government (Sternberg 1997) that proposed 13 thinking styles which have been subsequently reconceptualised into three types (Type I, II and III) by Zhang and Sternberg (2005: see also Zhang 2002a). Three studies were conducted: Study 1 and Study 2 quantitatively examined the role of thinking styles in academic achievement while ability and personality traits are statistically controlled; and study 3 qualitatively cross-validated the results from the studies 1 and 2 and explored if and how students made use of thinking styles in the course of learning. Participants were undergraduates from a University in Shangai, main land China. Study 1 involved 223 first-year students, study 2 was conducted among 504 students of all four academic years and 10 teachers, 45 students participated in focus group discussions in study 3. Selection of student participants in study 3 were made based on the notion of style types. In the qualitative studies, four instruments for students were used: the Thinking Styles Inventory (Sternberg and Wagner, 1992), the NEO Five
Factor Inventory (Costa and McCare 1992a), the Raven's Advanced Progressive Matrices (Raven 1998), and the Style Correlates Inventory (designed by the present researcher). Teachers responded to the Thinking Styles in Teaching Inventory (Grigorenko and Sternberg 1993d). The Style correlates inventory has two dimensions: things and people. Data Analysis of Study 1 were conducted at the level of individual style types. Quantitative results indicated that he predicted significant relationships of student achievement with thinking styles, ability and personality traits were not supported. To explain these results, the researcher argued that the student's academic grades might not be valid indicators of their achievement. Such an argument was also confirmed by the data from the group interviews. The four main hypotheses in the qualitative study were supported: (1) students of Type II styles perceived the roles of thinking styles in learning more often than did students of Type I styles, (2) students of Type I styles preferred to make efforts to match their teacher's teaching styles more than did students of Type II styles, (3) the things dimension tended to be correlated with students stylistic development and changes significantly more than did the people dimension; and (4) students of Type I styles appeared to have higher level of style awareness and higher degree of flexibility than did students with Type II styles. The limitations and major implications of the present research are discussed. Directions for further studies are put forward.
Megha Gakhar (2007) has studied the "Academic Achievement of Bachelor of Physiotherapy students in relation to their preferred learning and thinking styles."

The purpose of this study was to find out the relationship between the academic achievement with the learning and thinking styles. A sample of 136 students drawn from final year BPT course from Punjab, Haryana and Delhi. They were given (a) Group Test of General Mental Ability (Tandon 1971) (b) Socio-economic Status Scale (Kulshrestha 1982) (c) Styles of learning and Thinking (Venkataraman 1990) (d) Academic achievement was measured by taking aggregate marks of BPT I, II and III years from their college record. Data was analysed by using co-efficient of correlation technique. Results showed that learning styles like structural content, concrete learning, abstract learning and artistic learning vis-a-vis academic achievement were significant. Students whose academic achievement was higher, were likely to have stronger preference for the above mentioned learning styles.

Anatzohar (2006) : has studied the 'Higher order thinking in science classrooms : goals, means and research findings.'

Science learning provides a wonderful context for developing student's critical and scientific thinking. Critical and scientific thinking within science topics contributes to meaningful knowledge construction because it encourages students to process the science topics they learn by being active thinkers. In the, Thinking in Science Classrooms (TSC)
project instruction of thinking strategies is integrated with topics that constitute the regular school curriculum. General Principles pertaining to thinking strategies are made explicit by applying metacognitive activities in the class room. This article summarizes research findings showing that the TSC project induces gains in student's reasoning abilities and in their science knowledge. Students with both high and low academic achievements benefit from the TSC project. Finally, the findings show that explicit teaching of meta-strategic knowledge is a powerful educational tool for advancing the thinking of students with low academic achievements.

**Yenilmez et al (2006)**: has conducted research on "Students achievement in relation to reasoning ability, prior knowledge and gender."

This study investigated student's achievement regarding photosynthesis and respiration in plants in relation to reasoning ability, prior knowledge and gender. A total of 117 eight-grade students participated in the study. Test of logical thinking and two-tier multiple choice tests were administered to determine student's reasoning ability and achievement, respectively. An analysis of covariance (ANCOVA) was conducted to assess the effect of reasoning ability of student's achievement. The independent variable was the reasoning ability (low, medium, high), the dependent variable was the scores on the two-tier test. Student's grades in science in previous year were used as a
covariate. Analyses revealed a statistically significant mean difference between students at high and low formal levels with respect to achievement. Stepwise multiple regression analysis revealed that reasoning ability, prior knowledge and gender were significant predictors of student's achievement in photosynthesis and respiration in plants, explaining 42% of the variance.

Betainch, Ruba Fahmi and Zghrul, Lamma Hmoud (2006) have conducted research on "Jordanian TEFL graduate students' use of critical thinking skills (as measured by the Cornell Critical Thinking Test, Level Z)".

This study investigates the critical thinking skills of 50 students currently enrolled in the Master's TEFL programme at Yarmouk University, Jordan. The Cornell Critical Thinking Test, Level Z is utilized to test the students' use, or lack thereof, of the critical thinking skills of deduction, semantics, credibility, induction, definition and assumption, identification. The effect of the variables of the gender, age and grade point average on the student's critical thinking abilities is also investigated. The findings reveal that the respondents performed quite poorly on the test. Gender, age and grade point average were all found to have an effect. Male students outperformed female students. However, while older male students outperformed younger ones, younger female students outperformed their older counterparts. Respondents with higher grade point average scored better on the test. The findings have
implications for TEFL education in Jordan and other similar contexts. As teachers can be highly influential in creating a classroom environment that promotes critical thinking, they need to be informed about the importance of developing their student's critical thinking skills. To make this possible, EFL teachers should be allowed pre-service and in-service training opportunities to encourage the development of critical thinking.

Uszynska Jarmoc, Janina (2005) has studied the "Different types of thinking of seven-year old children and their achievements in school."

The theoretical basis of the research was the conception of human intelligence of Sternberg. The aims of the study were: (1) to determine the level of analytical thinking, creative thinking and practical thinking of seven-year old children; (2) to determine the relations between the level of analytical, practical and creative thinking and pupil's success in school; (3) to determine the association between the level of different kinds of thinking and their success as students; and (4) to explore the impact of teacher's perception of level of children's thinking on their achievements in school. The research was carried out on a group of 167, seven-year old children selected at random from urban schools and their teachers. This paper discusses how learning programmes foster and promote the development of different forms of thinking.
Siqueira, Luciana Gurgel Guida, Selange Muglia (2004) have conducted a study on "Brazilian students thinking and creating styles and their influence upon school performance."

The present research aimed to investigate the variables influencing thinking and creating styles as well as school performance of high school students. The sample was made of 152 students (74 girls & 78 boys) with an average age of 16 years. The instruments used were "Thinking and Creating Styles" (Wechsler 1999) scale and the school grades. The Univariate Variance Analysis analyzed the influence of gender and schooling on the creating styles and school performance. Pearson correlation compared thinking and creating styles with school performance. Factor 3 (Internal and External performance) and Factor 6 (Humor synthesis) had correlation with the school performance. It is concluded that some characteristics related to creative and thinking styles have an influence on school performance.

Amirault Ray J (2004): has conducted a research on "A study examining the effectiveness of two instructional treatments on student achievement, motivation and cognitive reasoning processes in a complex concept domain."

The purpose of this study was to determine the effectiveness of a concept-focused and a procedure focused instructional approach on adult learner concept acquisition in terms of performance, motivation and concept usage in reasoning. The concepts in the study consisted of
complex defined concepts from a highly technical domain. Eleven students in a graduate instructional design program were assigned via stratified groups to one of two instructional treatment groups, one concept-focused and one procedures-focused. Learners in the concept-focused group received conceptual relational database design instruction early in the instructional sequence, prior to procedural instruction. Learners in the procedures-focused group were presented the identical conceptual information, but embedded throughout an instructional sequence that emphasized procedural knowledge. Significant positive differences were found for far transfer performance and motivation levels in learners between the two groups. Verbal protocol analysis revealed no differences in time or trial and error strategies learners in the two groups took to solve a far transfer problem. These findings suggest that a concept-focused instructional strategy can positively impact student learning and motivation when learning complex defined concepts, and can assist learners in developing a more accurate mental model of these complex concepts.

Kowalski Patricia, Taylor Anette, Kujawski (2004) : have studied the "Ability and Critical thinking as predictors of change in students psychological misconceptions."

Based on the conceptual change literature, this study, assessed factors influencing change in student's misconceptions about psychology. We expected student's ability and their critical thinking to predict
whether they would change their misconceptions following completion of an introductory psychology course. GPA, scores on a test of critical thinking and scores in a misconceptions test given at the beginning and end of the course were obtained from 24 introductory psychology students. Analysis indicated that critical thinking made a unique contribution to the prediction of change in student misconceptions but that the effect of GPA was accounted for by its relation with critical thinking. The study suggests that misconceptions can change for students at any level of ability and are particularly likely to change for students who think critically.

Hyerk David & etal (2004) have studied the "Student successes with thinking maps: School based research, results, and models for achievement using visual tools."

Visual organisers reflect what we know of how the brain processes, stores, links and builds new learning. In this new resource David Hyerk, the originator of Thinking Maps, shares stories from teachers, principals, and trainers who have adopted the maps to increase student achievement and revitalize learning communities. Among the specific successes here, teachers and leaders will find ways to use Thinking Maps as a visual language and a frame of reference to: help all students access difficult content areas, provide a bridge to overcome cultural disconnects between teachers and learners, spur higher order thinking and discussion even in young children, offer a tool to assess content understanding in students
with limited English, provide a means for students to think and talk more deeply about mathematics, provide prompts and organizers for more effective writing; offer new learning community toolbox for teachers, students and parents, and integrate learning across grades and subjects and from prior knowledge to new learning. Students, teachers and administrators, have proven that thinking maps are the key to improving performance by students across culture and languages raising the quality of instruction and offering new pathways to sustain constructive preventions within schools.

Williams, Robert L and etal (2003): have studied the "Knowledge and Critical thinking as course predictors and outcomes".

Pre- and Post- measures of course knowledge correlated more strongly and consistently with course performance variables (essay quizzes, course projects, multiple-choice exams, and total course credit) than did pre- and post- measures of general critical thinking. In addition, the total sample (N=126) improved significantly on course knowledge from pre- to the post- assessment but changed minimally on critical thinking. The extent and pattern of change in critical thinking differed some what for students making high and low grades in the course. High-grade students achieved significantly more favourable changes on both critical thinking and course knowledge than did the low-grade students.
Chankraborty S. and Das S.K. (2002): have conducted research on "Divergent and convergent thinking of the students against open-ended mathematical problem."

The objectives of the study were (a) to find out the set of instructions that may sufficiently encourage the students in diversity and creativity, (b) to find out the practices and the phenomena related to Mathematics which arouse convergent thinking and to use them in teaching of mathematics, and (c) to find out the area of mathematics teaching where convergence or divergence of thinking can not be sufficiently predicted.

The sample was selected from class IV of Tasarala Sarberia Sanatan High School in the district of 24 Parganas (West Bengal). The school comprised students of mostly ordinary or average socio-economic status. The sample consisted of eight students but three of them had to be set aside as they did not follow the instructions. The content of class IV Mathematics was used in the test. Open-ended type questions involving abstract and life-centric situations were included. The validity of the questions was determined. Pilot test was conducted on two students. Moreover teacher educators of training colleges, secondary mathematics teachers and primary teachers teaching mathematics were consulted. The content validity of the questions was also determined.

Findings of the study showed that (a) Divergent answers were observed when the problems were of abstract nature (b) Culturally and
socio-economically equal students were inclined to common answers. 

(c) The divergent and convergent thinking among students in Mathematics helps teacher to undertake teaching programmes and 
(d) Convergent thinking of the students helps teacher to identify the area of Mathematics where teaching and learning can help students to attain knowledge.

*Cheung, Chau-Kiu and etal (2001)*: have studied the "Critical thinking among University students: Does the family background matter?"

Examined the influence of social class on critical thinking, learning, and motivation among 577 Hong Kong University students (mean age 21.2yrs.). Measures of critical thinking habit, critical learning, elaborative learning, intrinsic motivation and extrinsic motivation were composite scores of multiple items from a survey questionnaire. Results show that students of middle or upper class families or fathers excelled in critical thinking as compared with students and lower classes. They also demonstrated a higher critical thinking predisposition that included critical and elaborative learning, and showed lower extrinsic motivation. It is suggested that resources associated with social class may be partly responsible for these differences. Students who had fewer resources engaged more often in part time work, spent less time on study, and displayed less critical thinking and learning effort. Educational
characteristics including the field of study, level and years of study had no significant effect on critical thinking habit.

Stewart Patricia Jane (2001) has studied "The role of psychological type and critical thinking in doctoral student achievement."

Research on the effects of psychological types and critical thinking on student achievement at the doctoral level is limited, printing to the need for a clearer understanding of the independent variables of Sensing – Intuitive Psychological types and critical thinking's effects on student achievement. This study addressed the effects of psychological type and critical thinking on achievement, as well as the interaction effects between these variables. As leadership education and training creates curricula at tuned to the multiple variables of student achievement, a gap in the research concerning Sensing-Intuitive Psychological differences and critical thinking effects on achievement at the doctoral level provides a compelling call for studies to investigate these variables. This study tested the interaction and main effects of psychological type and critical thinking upon achievement, as measured by grade point average, in a doctoral program. A multiple-factor analysis of variance revealed significance differences in GPA between above average critical thinkers and below-average critical thinkers in a doctoral program (P<0.05). No significant differences in GPA were found between the sensing and intuitive students. Additionally no significant interaction effects of
Sensing-Intuitive Psychological types on GPA at the given levels of critical thinking were found. The findings provide support for the importance of critical thinking in higher education achievement. With the limited research of psychological type at the doctoral level, the current study's finding of non-significant main effects of Sensing and Intuitive types on achievement present a call for future research to determine the importance of psychological type as a learner variable associated with academic success at the doctoral level.

Money Sheila Mary (1998) has studied "the relationship between critical thinking scores, achievement scores, and grade point average in three different disciplines."

This investigation was undertaken to measure the critical thinking scores of students in a Canadian Community College and to determine whether there is correlation between the critical thinking scores and (1) the academic achievement scores and (2) the grade point averages of students in three different disciplines, business, music and nursing. The Cornell Critical Thinking Test was used to determine the critical thinking scores. The achievement scores and grade point average of the students were obtained from official records. Achievement score was the grade assigned by the instructor in the students major course of study, and grade point average was average of all the student's courses including the major in the semester that the testing was completed. Variables such as gender, age and English as a second language were also reported by the
students. There was no difference in the critical thinking scores of the students in the three disciplines. There was no correlation between the critical thinking scores and the achievement scores of the groups. There was a low correlation between critical thinking scores and GPA in the music students but not in the business or nursing students. There was no significant differences between the critical thinking scores of the males and the females. Critical thinking scores did not correlate with age and did not correlate with English as a second language. Implications of the study findings were discussed and recommendations made.

S. Srikantaswamy (1995) : has conducted an experimental study on the problem “An impact of a programme of critical thinking skills on the achievement of Secondary School Teacher Trainees of Bangalore city.”

The objectives of the study were ; (i) to develop a tool to measure critical thinking skills among the Secondary School Teacher Trainees of Bangalore city (ii) to develop a programme of critical thinking skills based on methods of teaching Physics (iii) to study the impact of the program of critical thinking skills on the achievement of Secondary School Teacher Trainees, in methods of teaching Physics and (iv) to find out the interaction of sex, intelligence, SES and Critical thinking skills on the achievement of Secondary School Teacher Trainees in methods of teaching Physics.
The purposive sampling technique was followed. A sample of 125 trainees from 04 aided colleges of education in Bangalore city who have taken Physics as their method of teaching. The Pre-test, Post-test procedure was followed for data collection. The data was collected by using the tools like Tool of Critical thinking skills (TOCTS), Raven's Progressive Matrices (RPM) and SES. Data was analysed with a 4-way analysis of variance, t-test and percentile ranks.

The study reveals that the programme of critical thinking skills has helped the teacher trainees improve their performance in critical thinking skills and achievement in methods of teaching Physics as evident from post tests and achievement test. Critical thinking skills has a significant impact on the achievement of teacher trainees in methods of teaching Physics. Further, it was observed that intelligence was a significant factor in influencing the critical thinking skills of trainees. The socio-economic factor do not show any significant influence on the critical thinking skills. The study also reveals that the male and female trainees do not differ in their critical thinking skills.

Stahl, Nancy (1990) : has conducted a study on "Developing criteria for a critical thinking programme using the Delphi technique", at Arizona State University.

The purpose of the study were : (1) to drive consensual definitions and characteristics of creative thinking, and (2) to use these definitions and characteristics as criteria for analysing four existing thinking skills
programs towards the selection of an appropriate creative thinking program for one particular school district.

After review of the related literature, 18 definitions and 48 characteristics of creative thinking were considered as representative examples of the wide variety of definitions and characteristics available to curriculum planners. From these two lists, ten definitions and twenty-five characteristics were selected to be presented to the panel of experts who would rank these following the Delphi procedures. The criterion used in selecting the 10 definitions and 25 characteristics was to give the panel the wide variety of items from these available to make their decisions regarding the rank order. These experts consisted of 16 professional educators from one school district, including classroom teachers and administrators, who were familiar with creative thinking and the gifted program and who volunteered to participate in the study.

Eventually one definition and 16 characteristics of those provided on the third round questionnaires were selected via the consensus procedure inherent in the Delphi technique as the criteria that would be used to guidance the analysis of four thinking skills programs. This analysis would determine which, if any, program came closest including what these panelists considered should guide the development of a critical thinking program for their school district. The four programs which were considered were CORT, philosophy for children, odyssey. A curriculum for thinking and tactics for thinking.
It was determined that all four programs were consistent with the one definition selected by the panel of experts. In the analysis of the programs using the 16 characteristics, it was found that Odyssey provided instruction consistent with 11 of these characteristics, more than any of the other programs although two other programs met nine each of the characteristics.

Bates (1991) has conducted a study on "Effect of a systematic inquiry intervention on the critical thinking skills of a sample of master's degree student" at the American University.

This study examined the effect of a systematic inquiry intervention, systematic inquiry: The Care and Feeding of a Research Idea (RI), on the creative thinking skills, as assessed through the Watson-Glaser Creative Thinking Appraisal (CAT) of a sample of master's degree students. An experimental study was conducted using pre-test and post-test design.

The four hypotheses tested in this study stated that the mean post test CAT score of the experimental group was significantly higher than that of the control group. They also stated that there would be significant improvement in the mean post test score of the experimental group over the mean pre-test score of the experimental group and that there would be no significant improvement in the mean post-test score of the control group when they were controlled to that group's mean pre-test score.
The sample was non-random volunteer, sample of 44 American University master's degree students which was divided into randomly selected experimental and control groups. Data were collected on gender, age and educational background of sample members. All sample members were given pre-test using the CAT, Form A. The experimental group was exposed to research idea. Both the experimental and control groups were post-tested using the CAT, form B, pre-test and post-test data were then compared within and between the groups.

The results supported two for the null hypotheses. These hypotheses were that there would be significant differences in the experiment group pre-test and post-test means and that there would be no significant difference between the experimental groups post-test mean and the control group post-test mean.

The results supported two of the research hypotheses. These were that, the mean pre-test CAT score of the experimental group would not differ significantly from the mean pre-test CAT score of the control group and that the mean pre-test CAT score of the control group and that the mean pre-test CAT score for the control group would not differ significantly from their mean post-test CAT score. The level for statistical significance was 0.05. The conclusion was drawn that showed no significant effect on the development of creative thinking skills in the master's degree students studied.
Selman (1989) has conducted a study on "Critical thinking, rationality and social practices" at University of British Columbia.

Critical thinking is a widely shared educational goal which has been granted more explicit attention than ever in recent years. Five major approaches to this are of educational concern has been influential to the development of educational practices, research programs and conceptualization in the field. Three of these approaches (the 'process' or basic skills approach, the problem solving approach and the logic approach) are found to be based on unfounded assumptions about the nature of reasoning and thinking, and in adequate attraction to the purposes which make critical thinking such a widely accepted educational goal. A fourth approach (the information processing approach) is found to involve instances of reduction which render incoherent of the terms with which we understand and assess our own reasoning, and that of others. The fifth approach (the multi-aspect approach associated with Robert Ennis) is not side effects essentially flawed, but is the reference of 'mental abilities' and with understanding the relationship between judgement and the other aspects of critical thinking.

It is argued that writers in the field of critical thinking generally have tried to purchase objectivity for their conceptions by connecting them with the ideal of disengaged knowledge, either as exemplified by the study of formal logic or the natural sciences. It argues that, in
contrast with this approach, we ought to recognize that values and value judgements are at the heart of critical thinking.

The ideal of disagreement tends to interface with our understanding of thinking as a normative activity grounded in our social practices. This thesis argues for the adoption of a realist position with regard to values, an expressivity understanding of language, an interpretive conception of rules. Some consequences of these positions for instruction, teacher preparations and future research are suggested.

Griffit Donald (1987) has conducted a study on "The effect of activity oriented science instruction on the development of critical thinking skills and achievement" at Northern Arizona University.

The purpose of this study was to determine whether students instructed in the activity oriented method developed a higher level of thinking skills and achievement than students instructed in the traditional text book recitation approach.

An experimental group of third and sixth grade students was instructed using an activity oriented approach while a control group of similar students was instructed by means of traditional text book recitation method. Both groups were taught using the same science units over a twelve-week period of time.

Both groups received the Cornell Critical thinking test. Level X (CCTT) and science subset of the Stanford Achievement Test (SAT) as a pre test and post test. The results were analyzed using separate t-tests
analysis of variances. The findings of the study reveals that there was no significant difference in teaching method in terms of developing critical thinking skills. However, there was a significant difference with respect to science achievement at both grade levels. Students instructed in the activity oriented approach showed significant growth over those instructed using the textbook method. The variable gender and grade level indicated that gender was of no significance to the study and neither grade level significantly out performed the other.

Byrne, Jones (1984) has conducted a study on "The effect of critical thinking skills instruction on achievement and attitude of elementary students differing in learning style preferences" at Virginia University.

The purpose of this study was to determine the effect of teacher paced v/s. self paced instruction of critical thinking skills on the achievement of higher level thinking process and student attitudes in elementary students with a high, moderate or low preference for teacher-structured learning.

Fifth grade students (n=35) were randomly assigned to three groups in two elementary schools, two treatment and one control using a random block design based on abilities or intelligence and verbal analogy achievement.

(1) The direct teaching of the skills rather than the methodology was the significant factor in greater achievement. Scores on measures of
critical thinking not directly related to the instruction and program did not show significant differences between groups, suggesting no transfer occurred in the ability to perform thinking tasks not specifically instructed.

(2) Although there were indications that a preference for self-paced self-structure learning resulted in higher achievement, the results were not statistically significant. A match between learning style preferences and teaching methodology did not result in greater achievement.

(3) Attitudes of students toward institutions of thinking skills were not affected significantly by teaching methodology nor by differing learning style preferences.

**Kehler Merita Trice (1982)**: has conducted a study on "The effects of programme for gifted high school students on critical thinking and the association of this variable to intelligence, sex, academic achievement and teachers rating of behavioural characteristics" at East Texas State University.

This study sought to determine of high school students who participated in a special program for the gifted made significant, improvement in critical thinking. The difference were compared by sex, specific school attendance, academic achievement, intelligence and critical thinking. The sample consisted of 132 high school students who participated in the first 5 years of the programme. The data from the pre-
test and post-test of the Watson-Glaser critical thinking appraisal, the science research associates, achievement series and the scales for rating the behavioural characteristics of superior students, were analyzed by the t-test for correlated scores, the t-test for independent means, the ANCOVA the F test and the Chi Square test, were used to test the hypotheses.

The major findings of the study were: (1) There was significant gain in critical thinking irrespective of sex. (2) There was significant difference found between high and low critical thinkers on all areas of academic achievement and abilities. (3) The reading was the only academic area which indicates a significant differences between students rated as low in gifted characteristics or high in gifted characteristics.

Fulgosi Ante (1977) has conducted a study on "Divergent and Convergent Semantic abilities and school grades."

Eighteen factor tests, developed for measurement of 5 semantic factors in J.P. Guilford's model of intellect were administered to 236 pupils in 3rd year of high school. The matrix of correlation co-efficients was tested with Batlett's Test and found significant and adequate for factor analysis. The 5 factors were extracted by the method of principal axes and rotated to the Varimax position. Grades from 9 school subjects (Croatian, Language, Foreign language, Philosophy, Geography, Biology, Chemistry, Physics and Mathematics and General success) were
factor analysed one by one, by extended factor analysis. It was found that 3 semantic factors have significant correlations (larger than 0.30) with grades of 3 or more school subjects each. The amount of variance in school subjects explained by the 5 semantic factors ranged from 24% to 34%. Factors of convergent semantic abilities showed higher and more numerous correlations with school subjects than factors of divergent semantic abilities.

Olive Helen (1972) has studied "The relationship of divergent thinking to intelligence, social class and achievement in high school students."

Investigated the degree of distinctiveness between divergent thinking and general intelligence in 434 9th and 11th graders. Students were given Guilford's tests of divergent thinking and the Otis Quick-scoring Mental Ability Test. Divergent thinking showed a significant but modest relationship with intelligence and with school achievement and a low but statistically significant relationship with social class. The relationships between divergent thinking and both school achievement and social class were lower than those of typically found between general intelligence and these two variables.
2.3 STUDIES RELATED TO EMOTIONAL INTELLIGENCE AND ACADEMIC ACHIEVEMENT:


The objectives of the study were; (i) to examine the relationship among emotional intelligence, adjustment, self-concept and scholastic achievement of higher secondary students, (ii) to find out whether there is significant difference in emotional intelligence of boys and girls, (iii) to find out whether there is significant difference in emotional intelligence among higher secondary students with respect to type of college. The sample for the study was drawn through stratified random sample technique. The sample consists of two Government, two private aided, five private un-aided and one private First Grade colleges. Total number of students involved in the study 200 (100 boys and 100 girls). Emotional intelligence test of N.K. Chadha, Adjustment. Inventory for college students of Sinha and Singh, Self-concept scale of Sarbin were used for data collection. The data was analysed with t-test and product moment correlation. The findings of the study were (a) there exists a positive relationship among Emotional Intelligence, Adjustment, Self-concept and achievement of higher secondary students, (b) female students possess higher emotional intelligence than the male students and (c) there is no significant difference in emotional intelligence of higher
secondary students with respect to the type of college in which they are studying.

Ruksana Nasar and Zeenat Nasar (2008) studied the relationship between ‘Emotional Intelligence and Creativity’.

The objectives of the study were, (i) to observe emotional intelligence levels of undergraduate male and female college students, and (ii) to find out the relationship, if any between the dimensions of emotional intelligence and creativity of the undergraduate college students of both gender. The study was encountered on 100 male and 100 female undergraduate college students, having age range from 17 years to 20 years with a mean of 18.75 years. Some demographic variables like socio-economic status, educational level and IQ level have been matched in both the samples. All of them were from urban background. Mohsin’s General Intelligence Test, Hindi version of Emotional Intelligence scale (HEIS-26) by Pandey and Anand (2003) and three verbal tests of Passi Test of Creativity by Passi (1989) were used to collect the data. The results show that the presence of higher emotional intelligence in the adolescent girls students in comparison to the boys. The male college students’ scores on emotional intelligence scale has been found to be positively correlated to their total creativity scores. However female college students sample scores on emotional intelligence has been found to be correlated positively and significantly (P<0.01) to creativity.

The study examined the influence of emotional intelligence, gender and age on the academic self-efficacy of distance learners. The participants were 320 distance learner’s 150 males and 170 females. Two valid and reliable instruments namely, emotional intelligence questionnaire and academic self-efficacy scale were administered on the participants. The objective of this study was to examine the influence of emotional intelligence, gender and age on the academic self-efficiency of distance learners in Ibaden. The study employed descriptive survey research design to carry out the investigation. Pearson product moment correlation, Multiple regression analysis and t-test statistics were used to analyse data. The results show that emotional intelligence, gender and age were vital factors in academic self-efficiency of distant learners. Significant different was also found between the academic self-efficiency of male and female participants. Female participants demonstrated high academic self-efficiency than their male counterparts.

Rode Joseph C. Mooney and etal (2007) have studied the "Emotional Intelligence and Individual performance: Evidence of direct and moderated effects."
They have examined the direct and moderated effects of an ability based measure of emotional intelligence on individual performance in a sample of business undergraduates. Controlling for general mental ability and personality, emotional intelligence explained unique interpersonal variance in performance ratings on only one of two measures of interpersonal effectiveness (public speaking effectiveness). However, the interaction of emotional intelligence with conscientiousness explained unique incremental variance both in public speaking and group behaviour effectiveness, as well as academic performance. They concluded that the effects of emotional intelligence on performance are more indirect than direct in nature. Individuals must not only have emotional intelligence, but also must be motivated to use it.

Humphrey Neil, Curran Andrew, Moris Elizabeth (2007) have conducted a study on "Emotional Intelligence and Education: A critical review."

In recent years there has been an increased interest in the role of Emotional Intelligence in both the academic success of students and their emotional adjustments in school. However, promotion of, emotional intelligence in schools has proven a controversial pursuit, challenging as it does traditional "rationalist" views of education. Further more, research finding in this area have been in consistent at best. In this article the authors discuss the following key questions relating to this important debate. What do this authors mean by emotional intelligence?
What impact would improved emotional intelligence have on learner's emotional health and well being, academic achievement, and other adaptive outcomes? Can emotional intelligence be taught? It is felt that these are the key issues for consideration in developing policy, practice and further research in this area.

Brackett, et al. (2007) have studied on the "Emotional Intelligence in the classroom : Skill based Training for teacher and students."

The authors provide a detailed description of a school-based Emotional Intelligence (EI) intervention. The approach is based on the EI-ability model of Mayer et al. The chapter provides powerful exercises that are designed to improve EI amongst both teachers and students. It also provides useful EI work sheets that help to structure the EI intervention. Finally, the chapter reports preliminary findings on the benefits of the school based EI intervention for improving well-being, social skills and grades.

Cyr Jennifer (2007) has conducted a study on "Emotional Intelligence as a predictor of performance in college courses."

Emotional Intelligence has received much attention in the literature in the past two decades. It has been likened to social intelligence, something that is distinct from cognitive ability, suggesting that both cognitive and emotional aspects of intelligence need to be looked at when trying to understand the concept of intelligence.
This study, examines the relationship between emotional intelligence and cognitive ability in predicting academic achievement by using Mayer, Salovey and Caruso's (1997) four branched model of emotional intelligence. The Mayer Salovey, Caruso Emotional Intelligence Test (MSCEIT) research version 2.0 was used to predict performance in college. The predictive ability of emotional intelligence as measured by the MSCEIT was assessed by correlating MSCEIT scores from 237 Rutgers University students with their cumulative GPA. The relative predictive ability of emotional intelligence over SAT and the incremental predictive validity were explored using a multiple regression analysis, results did not find any significant prediction of performance by emotional intelligence alone, or combined with SAT. Emotional intelligence also did not account for any additional variance in GPA beyond that accounted for by cognitive ability as measured by SAT. This study did not substantiate claims that emotional intelligence will predict success in college.

Darsana M. (2007) : has conducted research on "Relationship between emotional intelligence and certain achievement facilitating variables of higher secondary school students."

The objectives of the study were (a) to find the relationship between emotional intelligence and achievement facilitating variables for the whole sample and relevant sub-sample. (b) to compare emotional
intelligence of groups in pairs classified on the basis of sex, locale of the school, nature of school management and socio-economic status.

The study has been conducted on a representative sample of 387 (191 boys and 196 girls) higher secondary school students of Kollam District in Kerala selected on the basis of stratified sampling techniques. Due representation to factors like sex, locale of the school, and nature of school management was given while selecting the sample. Tools used for the data collection were (a) Emotional Intelligence Test (b) Socio-economic status scale (c) Achievement Motivation Scale (d) Examination anxiety scale and (e) self-concept scale data was analysed using product moment co-efficient of correlation and t-tests.

Findings of the study showed that (a) boys and girls differ in their emotional intelligence and emotional understanding (b) Boys perform better than girls in emotional intelligence and emotional understanding (c) Boys and girls show no significant difference in emotional perception, emotional facilitation of thought and emotional management (d) There is a significant difference between high SES and low SES with emotional intelligence.

Szuberla AL (2006) : has conducted research on "Emotional Intelligence and school success."

Despite their ubiquity, standardized test scores do not completely determine student success. Recent research has shown a relationship between emotional intelligence and traditional school success metrics.
among young adults. This study closes a gap in the literature by examining that relationship in an elementary school setting. A statistical description of the extent to which such relationships exist was derived from bivariate and multivariate regression analyses of two particular metrics. Emotional intelligence was measured using the emotional Intelligence Test: Youth Version. Terra Nova standardized test percentiles were used as measures of school success. The study sample comprised 61 intermediate elementary students from a single school in suburban Alaska. Significant relationships were found between (a) Understanding emotions and reading, language and mathematics composites from the Terra Nova standardized test  (b) Managing emotions and reading composite score and (c) Total scores of both emotional intelligence and school success. No significant relationships were found between perceiving emotions and any of the Terra Nova composites. These results raise the possibility that the emotional intelligence instrument may by assessing reading and language rather than emotional intelligence. In light of the nationwide movement toward improving student performance in an era of increasingly constrained budgets, the need for psychological studies to investigate how school success is related to the emotional state of students has become even more pronounced. Results of this study suggest that, on some levels, such a connection exists. At the elementary school level, early interventions can be designed to incorporate the emotional aspects of
how children perceive, appraise, and ultimately analyze their own academic success.

**Gakhar S.C. and Manhas K.D. (2005)**: have studied the "Cognitive correlates of Emotional Intelligence of Adolescents."

The objectives of the study were (a) to find out the relationship of emotional intelligence with cognitive variables such as general intelligence, academic achievement and creativity and (b) to find out the significant difference in the emotional intelligence of male v/s. female, government school v/s. private school, scheduled caste v/s. non-scheduled caste, rural v/s. urban and art v/s. science students.

The study was carried out as a descriptive survey method. It was conducted on 400 students of class XI studying in various private and government schools in both urban and rural areas of three districts of Jammu and Kashmir namely, Udhampur, Kathua and Jammu. The tools used to collect data were: Emotional Intelligence scale by Khera and Kaur, Group Test of General Mental Ability by Tandon, and Verbal Test of Creative Thinking by Baquer Mendi. The class X, board results were used as a measure of academic achievement. The data was analysed using product-moment correlation and t-test.

Findings were (a) significant and positive correlations were found between emotional intelligence and all the cognitive variables namely, intelligence, creativity and academic achievement (b) no significant difference was observed between boys and girls, with respect to
emotional intelligence (c) significant difference was observed in the emotional intelligence of adolescents studying in private and government schools with the private school students scoring higher (d) a significant difference was observed between the emotional intelligence of science and arts students with the science students scoring higher, and (e) no significant difference was observed between adolescents of rural and urban areas and scheduled and non-scheduled caste.

**Drago Judy M (2005)** has studied the "relationship between emotional intelligence and academic achievement in non-traditional college students".

This correlational study examined the relationship between emotional intelligence and academic achievement in non-traditional college students. Because students differ in cognitive ability, with some students being better prepared for the collegiate environment than others, the role of emotional intelligence in academic achievement must be better understood. Noncognitive factors such as emotional intelligence may supplement or enhance student cognitive ability. In this study, emotional intelligence, achievement motivation, anxiety and cognitive ability were predictor variables. The criterion variable was academic achievement as measured by student GPA. Data was collected using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), the State Trait Anxiety Inventory (STAI), the Achievement Motivation Profile (AMP), the Wonderlic Personnel Test (WPT), and the Student
Demographic Survey (SDS). Bivariate and multivariate correlation and regression analyses were used to test the study's statistical hypotheses. Results demonstrated that emotional intelligence is significantly related to student GPA scores, student cognitive ability scores, and student age. Additionally, student anxiety was related to certain emotional intelligence abilities. No significant relationships, however, was found between emotional intelligence and achievement motivation. Overall, the results suggest that academic achievement is related to student's ability to recognize, use and manage their emotions. This suggest the need to incorporate emotional intelligence curriculum into college degree programs to help students increase their emotional intelligence.

Abdullah, Maria Chong et al (2004) have studied the "Emotional Intelligence and academic achievement among Malaysian secondary students."

Class rooms are always filled with youngsters displaying a wide range of concerns and behavioural problems that often make learning in the classroom difficult and ineffective. Students are often found to suffer from poor self-awareness, low self-esteem, lack of motivation, little self-discipline, poor peer interaction, an inability to express feelings effectively, and sometimes, a significant amount of emotional pain such as feeling sad, unhappy, anxious, frustrated, and angry. Based on the concept and model of Emotional Intelligence Quotient (EQ) by Mayer Salovey and Caruso (1997), the authors discuss how the mechanism of
EQ can enhance student's emotional competency which in turn improves their learning in the classroom. Present study was conducted in 5 secondary schools in the state of Selongar, Malaysia, to examine student's overall level of EQ and the relationship between students level of EQ and their level of negative affect (anxiety, anger and frustration) towards specific school tasks and academic achievement. Research findings indicate that there is linear negative relationship between student's level of EQ and their level of negative affect towards specific school tasks, and positive linear relationship between EQ and academic achievement. Findings also indicate positive relationship between EQ and gender differences.

**Pandit Bansbihary and Yunus Pathan (2004)**: have conducted a study on "Emotional Intelligence of secondary school teachers in relation to gender and age."

The purposes of the study were (1) to determine the level of emotional intelligence of secondary school teachers (2) to compare the level of emotional intelligence of secondary school teachers (3) to compare the emotional intelligence of the groups below 30 years, between 31 and 45 years and between 46 and 60 years.

The sample consists of 500 secondary school teachers ranging from 24 to 50 years of age belonging to both urban and rural Dhule District of Maharashtra. Out of this 350 were male and 150 were female. The tool used for data collection was a questionnaire on Emotional Intelligence.
developed by Chandra and Dilipsingh. The data was analysed with the t-test.

Major findings of the study were (1) there was no significant difference in the level of emotional intelligence of male and female teachers. (2) there was no significant difference in the level of emotional intelligence among the groups that is group I, II and II and even age wise.

Mohana Sundaram et al (2004) have conducted a study on "Emotional Intelligence and achievement of teachers at secondary level."

The sample consists of 269 teacher trainees at DIET's and TTI's. They were selected using stratified random sampling technique. Three DIET's, one government TTI and three private TTI's were taken for the study. The tool used for the study is scale of Emotional Intelligence developed by the researcher. Data was analysed with t-test and Pearson product moment correlation. The main objectives of the study were (1) to study the emotional intelligence of the teacher trainees with respect to their sex, management and type of institution. and (2) to find out the correlation between emotional intelligence and academic achievement of the teacher trainees in various subjects. The findings were (1) The men and women teachers does not differ in their emotional intelligence (2) the teachers of government schools were at high level than the teachers of private schools (3) there was a significant low positive correlation between emotional intelligence and academic achievement.
Vela, Robert H. Jr. (2004) has studied "the role of emotional intelligence in the academic achievement of first year college students."

Although progressive efforts have been made on improving student performance and retention, student's success in higher education continues to decline. The inability to connect the cognitive and affective domains in student development has resulted in poorly prepared students in society. The study examined the role of emotional intelligence in the academic achievement of first year college students. The subjects of the study included 760 first year college students from a selected University in South Texas. Each student completed a self-report emotional intelligence assessment. Additional data examined included first semester grade point averages. SAT scores, gender, and ethnicity. Descriptive statistics were used to examine the study. Pearson's product moment correlation and multiple regression analysis statistical procedures were used to examine the relationship between emotional intelligence skills and the academic achievement of first year college students. SAT scores, gender and ethnicity were also investigated as independent variables. The results of the study showed that there is a significant correlation between emotional intelligence skills and the academic achievement of first year college students. Findings also suggest a significant relationship between emotional intelligence skills and academic achievement according to gender and ethnicity. Further more, the results showed that SAT scores, when coupled with emotional
intelligence skills, can better predict academic achievement. Self-management skills were significantly related to academic achievement.

Parker James D.A. et al (2004) have studied on "Emotional intelligence and academic success: Examining the transition form high school to University."

The transition from high school to University was used as the context for examining the relationship between emotional intelligence and academic achievement. During the first month of classes 372 first-year full-time students at a small Ontario University completed the short form of the Emotional Quotient Inventory (EQ-i: short). At the end of the academic year the EQ-i: short data was matched with the students' academic record. Predicting academic success from emotional intelligence variables produced divergent results depending on how the former variable was operationalized. When EQ-i: short variables were compared in groups who had achieved very different levels of academic success (highly successful students who achieved a first-year University GPA of 80% or better versus relatively unsuccessful students who received a first-year GPA of 59% or less) academic success was strongly associated with several dimensions of emotional intelligence. Results are discussed in the context of the importance of emotional and social competency during the transition from high school to university.

Petrides K.V. et al (2004) have studied "the role of trait emotional intelligence in academic performance and deviant behaviour at school."
This study examines the role of trait Emotional Intelligence (trait EI) in academic performance and in deviant behaviour at school on a sample of 650 pupils in British secondary education (mean age as 16.5 years). Trait EI moderated the relationship between cognitive ability and academic performance. In addition, pupils with high trait EI scores were less likely to have had unauthorized absences and less likely to have been excluded from school. Most trait EI effects persisted even after controlling for personality variance. It is concluded that the constellation of emotion-related self-perceived abilities and dispositions that the construct of trait EI encompasses is implicated in academic performance and deviant behaviour, with effects that are particularly relevant to vulnerable or disadvantaged adolescents.

Shawal V.K. (2003) has conducted a research on the problem “A study of correlated and Nurturance of Emotional Intelligence in Primary school children.”

The objectives of the study were (i) to develop a measure of emotional intelligence appropriate for primary school children in India, (ii) to examine the differences in emotional intelligence in children belonging to various eco-cultural groups (iii) to examine the relationship between emotional intelligence on the one hand, and academic achievement, attention and social functioning of children, on the other (iv) to nurture emotional intelligence in a selected group of children.
The sample consisted of 200 children (100 children from rural and 100 from urban schools) of fourth standard studying in four Municipal Corporation of Delhi (MCD) primary school selected randomly. Tools used included Hindi version of Multifactor Emotional Intelligence Scale (MEIS), Social Emotional Scale, Expressive Attention Test (Neglieri and Das 1998 and 1999) and Academic Achievement to collect the data. The data was subjected to various statistical techniques such as ‘t’ test, ANOVA and Pearson correlation.

The findings were (1) the overall sample of 200 children as well as the eco-cultural groups did not show much difference on the socio-demographic variables (2) the four components of emotional intelligence namely identification of emotions, Assimilation of emotion, Understanding of emotions, and Regulation of emotions correlated significantly with the overall emotional intelligence score, thus emphasizing the validity of the Hindi adapted version of MEIS. (3) the understanding and regulation of emotions component of the Emotional Intelligence also correlated with variables underlying the general intelligence like academic achievement. On the other hand, identification and assimilation of emotions components co-vary more with socio-cultural and environmental factors like number of family members and occupation of father. (4) Analysis of different components of emotional intelligence in the present study printed towards a possibility of two-factor structure of emotional intelligence. One pole of
this was depicted by the closer relationship between identification and assimilation of emotions component and the other pole was represented by the togetherness of understanding and regulation of emotions components of emotional intelligence. (5) the rural children emerged as having higher emotional intelligence in comparison to their urban counterparts. Overall, girls had higher emotional intelligence than boys. (6) As a group rural boys achieved the highest score on the overall emotional intelligence due to their comparatively better performance on the assimilation of emotions component of emotional intelligence. Rural girls were better at understanding and regulation of emotions while urban girls had comparatively, the poorest emotional intelligence. (7) The study distinctly indicated that rural domicile seems to have positive influence on the degree of emotional intelligence and female sex is another factor which favourably vary with higher emotional intelligence. These findings highlight the influence of microenvironment and constitution on emotional intelligence.

**Barchard Kimberly A (2003)**: has worked on the question "Does emotional intelligence assist in the prediction of academic success?"

Some authors have claimed that emotional intelligence predicts success at work, at school, and in relationships, as well as or better than IQ. Little research exists to support or refute this claim a present. In this study, the ability of emotional intelligence to predict academic achievement was examined in a sample of undergraduate psychology
students, using year-end grades as the criterion. The predictive validity of emotional intelligence was compared with the predictive validity of traditional cognitive abilities and the Big five dimensions of personality. In addition, the incremental predictive validity of each of these three domains was assessed. In this setting, only some measures of Emotional Intelligence predicted academic success, and none of these measures showed incremental predictive validity for academic success over and above cognitive and personality variables. It may be that the overlap of intelligence and personality limits their incremental predictive validity in this context.

Sonnenschein, Mary F (2002): has studied on the "Effect of emotional intelligence competencies on academic performance of Algebra I students."

The purpose of this research study was to investigate the effect of emotional intelligence skills on the academic performance of Algebra I students. Research was conducted at a St. Charles high school and consisted of fifty-five subjects, twenty-seven of whom were in the experimental group and twenty-eight in the control group. Subjects were randomly assigned to one of two Algebra I classes taught by the same instructor. A pre-test post-test control group design was used. Both groups were given an Algebra I pretest and initial equivalence on the dependent variable of academic performance was verified. The subjects were also given the Baron Emotional Quotient Inventory: Youth Version
and initial equivalence on the independent variable of emotional intelligence was established. Throughout the twelve-week study, the control group was taught the traditional Algebra I curriculum. The experimental group was taught the identical Algebra I curriculum combined with the emotional intelligence skills self-awareness, motivation, self-management, empathy and social adaptness. Subjects in the experimental group participated in class discussions, activities, and role playing, complete worksheets, and wrote journal entries. During the final week, the subjects were given an identical Algebra I exam. The mean score of the experimental group was 79.0, the mean score of the control group was 74.3, representing a difference of 4.7 percent. The achievement scores on the exam were analysed using a t-test for independent samples. Data analysis resulted in a t-score of 1.156 (df=53, a=0.05), which was not large enough to reject the null hypothesis. The increase in the experimental group's academic performance was not statistically significant. A similar conclusion was made regarding the growth of emotional intelligence. While the experimental group showed an increase of 3.24 percent on the Emotional Quotient Inventory, it was not statistically significant.

**Barbara Grace S. (2002)**: has conducted a research on the topic "An examination of emotional intelligence: Its relationship to achievement and the implications for education."
Although educational reform efforts have made progress in improving academic achievement, inadequate student performance continues to be a problem. The lack of progress forebodes serious discontent in society and threatens the freedom of all people. This study examines emotional intelligence and its relationship to student achievement. The subjects of the study included 200 eleventh and twelfth grade students from three school districts in South Texas. Each subject was asked to complete a self-report emotional intelligence assessment measure. Additional data examined included Texas Learning Index (TLI) scores in mathematics and reading from the Texas Assessment of Academic Skills (TAAS), a standardized test created by the state of Texas as part of its accountability system; gender, ethnicity, and socio-economic status. A factor analysis was used to examine the scale items of the instrument since the measure of emotional intelligence is still in the development stages. Pearson correlational and standard multiple regression statistical procedures were applied to examine the relationship between emotional intelligence skills and academic achievement. Differences in achievement according to gender, ethnicity and socio-economic status were also investigated. The results of study showed that there is a significant relationship between selected emotional intelligence skills and academic achievement. Results also suggest that gender differences in achievement may be influenced by emotional intelligence. The resilience of students who succeed despite
environmental and economic deficiencies may also be related to emotional intelligence. Inter personal communication skills were significantly related to achievement.

Fannian Barbara Ellen (2002) has studied "The contributions of Emotional Intelligence to academic achievement and production."

This study examined the relationship between emotional and analytic intelligences upon academic achievement and academic production. One hundred and fifteen children ages 13 to 14 were administered the Adolescent Multifactor Intelligence Test. Previously administered academic test scores from Terra Nova Achievement Test and scores from the Otis-Lennon School Ability Test were also used. It was hypothesized that there would be a positive relationship between emotional intelligence and academic achievement and academic production. The study also examined to what extent analytic intelligence and emotional intelligence contribute to academic achievement and academic production. Analytic intelligence, as measured in the present study, was found to be a better predictor of grade point average and academic achievement test scores than emotional intelligence. Emotional intelligence was also found to significantly correlate with the grade point average and achievement test scores. This study supported Mayer and Salovey's findings that emotional intelligence has a low to moderate correlation with analytic intelligence.
Boyce David Alexander (2002) : has studied "The correlation of Emotional Intelligence, academic success and cognitive ability in master's level physical therapy students."

The study of emotional intelligence is relatively new. Intelligence has been found to be a predictor of success in school and on the job. Most of the discussion concerning intelligence to date has centered on traditional intelligence testing. Traditional methods of testing intelligence may not evaluate intelligence comprehensively. Scholars have recently suggested that emotional intelligence may account for a significant portion of overall intelligence. It has been proposed that emotional intelligence is a predictor of success. The purpose of this study was to determine if any correlations exist between emotional intelligence as measured by the Multifactor Emotional Intelligence Test (MEIS), general cognitive ability as measured by the Wonderlic Personal Test, and the academic success of master's level physical therapy students. The results of this study indicate that cognitive ability or general intelligence of master's level physical therapy students is "bright normal", and their level of emotional intelligence is above average. In addition, no correlation between cognitive ability and academic success was found and that a low correlation between emotional intelligence and cognitive ability existed. Finally, it was determined that a low correlation between emotional intelligence and academic success existed.
Woitaszewski, Scott Alan (2001) : has studied "The contribution of emotional intelligence to the social and academic success of gifted adolescents."

The purpose of this study was to determine if the emotional intelligence of gifted adolescents contributes significantly to their social and academic success, and specifically if emotional intelligence was of importance above and beyond traditional psychometric intelligence (IQ). This study tested the claims of Goleman (1995) who argued that emotional intelligence was critical to our understanding of human success and often time more important than IQ. A group of 39 adolescents (mean age = 16 years 6 months) who were enrolled in a residential high school for gifted youths participated. The adolescent Multifactor Emotional Intelligence Scale (AMEIS) (Mayer, Salovey and Caruos, 1996) and the Test of Cognitive Skills (CTB MacMilan / McGrawHill, 1993) were utilized to attain overall levels of emotional intelligence and IQ, respectively. The Behaviour Assessment system for children Self-Report-Adolescent Version (BASC-SRP-A) (Reynolds and Kamphaus 1992) was used to measure two types of social success; interpersonal relations and social stress. Academic success was determined by student grade point averages. The results of hierarchical multiple regression analysis revealed that emotional intelligence did not contribute significantly to the social and academic success for these gifted adolescents. These results suggest that Goleman's argument about
the significance of emotional intelligence may be over stated, at least when studying this sample of gifted adolescents. However, future research will need to address the need for improved measurement of emotional intelligence, possibly studying specific components of emotional intelligence. Larger samples that include gifted students from more common settings may also help clarify the importance of emotional intelligence in this population.

Misra (1986) has conducted a study on "A study of meaning in life stress and emotional intelligence of secondary school in Calcutta."

The objectives of the study were (1) to study whether teachers varied on degree of overall in life and if they showed a trend towards low meaning (2) to identify the main source of stress in teacher and to investigate, if teachers varies extend of experienced stress (3) to study of teachers varied in extent of perceive emotional intelligence (4) to study the relationship between stress and emotional intelligence. The tools used for the data collection were Mo-holiesks (1961) purpose in life text, Maslach and Jackson's (1981) inventory. The sample of 345 teachers from 15 secondary schools and in-service teachers of three training institutes formed the samples of the Calcutta district. Descriptive and non-parametric statistical techniques were used to analyse the data.

The major findings of the study were; (1) meaningfulness of the teacher was quite high according to their own perceptions. (2) meaning in professional life was derived primarily from psychic rewards (3) the
relationship between some variables through test and stress reported by teachers was highly significant. (4) age difference was significant with regard to emotional intelligence of teacher (5) sample of teachers had low degree of emotional intelligence and (6) sex difference was significant emotional intelligence variable.

2.4 STUDIES RELATED CREATIVITY AND ACADEMIC ACHIEVEMENT:

Alam M. Mahammed (2009) : studied that “Effect of creativity and socio-economic status of students on Academic Achievement.”

The investigation is intended of finding the extent of relationship between creativity and socio-economic status of the students and Academic Achievement. The major objectives of the study were, (i) to find out the relation of academic achievement with (a) creativity (b) socio-economic status of the students for the total sample and sub-samples and (ii) to compare boys and girls, urban and rural samples with regard to their creativity, socio-economic status and academic achievement of the students. The survey method of research was followed with a sample size 400 students drawn from different government schools of Darbhanga and Madhabani districts of Bihar. Creativity Test by Baquer Mehdi (Hindi version), scoio-economic status scale by G.P. Srivastava were used for data collection. Data was
analysed with, t-test and co-efficient of correlation values. The findings of the study were; (i) creativity has significant positive relationship with academic achievement. (ii) the socio-economic status and academic achievement are positively correlated (iii) Muslim and Non-Muslim, Urban Muslim and Urban Non-Muslim and Rural Muslim and Rural Non-Muslim students differ significantly in their creativity, socio-economic status and academic achievement.

Rindermann H. Neubauer AC (2004): has conducted a study on "Processing speed, intelligence, creativity and school performance: Testing of causal hypotheses using structural equation models."

According to mental speed theory of intelligence, the speed and information processing constitutes an important basis for cognitive abilities. However the question, how mental speed relates to real world criteria, like school, academic, or job performance, is still unanswered. The aim of the study is to test an indirect speed-factor model in comparison to rivaling models explaining the relationship between different mental abilities and performance. In this speed factor model, basic cognitive processing is assumed to influence higher mental abilities (IQ and creativity). Intelligence and creativity themselves should be valid predictors of school performance. We computed bivariate correlations and structural equation models to test this hypothesis, using indicators of processing speed (Zahlen-Verbindungs Test ZVT and Coding Test), Psychometric Intelligence (Kognitiver Fahigkeits Test
KFT) and Raven's Advanced Progressive Matrices (APM), Creativity (Verbaler Kreativitats Test, VKT) and Verwendungs Test (VWT) and school performance. In a sample of 271 students from German Gymnasiums (class levels 9 to 11) the speed factor model can reproduce at best the empirical relationships between processing speed, intelligence, creativity and school performance. It assumes that processing speed influences higher mental abilities (Intelligence and Creativity). Which in the sequel, influence school performance. Therefore processing speed seems to have no direct effect on school performance, the effect is indirect as it operates via meditation through higher cognitive abilities.

**Yeh, Yu-Chu (2004)**: has conducted a research on "Seventh grader's academic achievement, creativity and ability to construct a cross-domain concept map – A brain function perspective."

This study proposes an interactive model of cross domain concept mapping with an emphasis on brain functions, and it further investigates the relationship between academic achievement, creative thinking, and cross-domain concept mapping. Sixty-nine seventh graders participated in this study which employed two 50 minute instructional sessions. The findings suggest that (a) the seventh graders may lack the awareness or ability to integrate knowledge and make connections between their learning and life experiences, (b) creative thinking, academic learning and concept mapping share similar capacities, and (c) cross-domain
concept mapping, which fosters cross-domain information integration and connections between learning and life experiences, can be an efficient mental tool in understanding a student's creative thinking and academic learning.

Sheyla Pardo Blumen (2002) has conducted a study on the "Effects of a teacher training workshop on creativity, cognition, and school achievement in gifted and non-gifted second grade students in Lima, Peru."

Enrichment for the gifted in regular classroom was studied with a teacher training workshop developed for the purposes of this study. Participants were 231 second graders of Lima Public Schools (in Peru). The instruments used were first culturally adapted to the Lima context. The total sample of 231 children (aged 6-8 yrs.) consisted of 125 gifted and 106 non-gifted students. Results reveal a significant ability time interaction in figural-creative performance and a condition, time significant interaction effect. Also analysis of school achievement showed an ability time interaction effect. These findings argue for the further development and use of teacher training programmes in educating the gifted within the regular classroom in Lima Public Schools.

Steven William Attman (2001) has conducted the study on "Creativity and academic success."

It has been suggested that Academic success is linked to a personal attribute loosely defined as 'Creativity'. Arguments presented by various
researchers seem intuitively convincing, yet the results of replicable research in this area are inconsistent or inconclusive, at best. This study is an attempt to bring greater clarity to this morass of opinions and information. A sample of Undergraduate University students was tested for creativity using a subset of the Torrance Tests of Creative Thinking. Results of these tests were analyzed with regard to data from academic transcripts and demographic information. Results of the analysis showed a strong, highly significant link between creativity and Academic success (operationalized as Grade Point Average). Further analysis uncovered a number of relationships between specific types of creative thinking and particular courses and fields of study. It is noted that this relationship may present a part of 'Chicken and Egg' problem, and thus it is recommended that researchers initiate a longitudinal study to determine the possible effects of schooling on creativity, and the interactive properties of the relationship between Creativity and Academic Success. Further research with larger subject pools is also strongly recommended.

Necka Edward, Kalwa Aneta (2001) have studied the, "Creativity, implicit learning and depth of processing."

Fifty eight high school students obtained a battery of three tests. Creativity was assessed with a verbal divergent thinking test. Incidental learning was investigated with the use of the depth of processing, similarly to the original procedure devised by Craik and Lockhart. After sometime, they were unexpectedly given a recognition task in which
items previously elaborated at a shallow or deep level had to be indicated. Recognition of elements that were not memorized intentionally served as an indication of implicit learning. Participants also filled in the learning styles questionnaire, which allowed to assess their preferred modes of academic learning. It appeared that creative participants differed from less creative ones in the efficiency of implicit learning. Their supremacy was particularly evident concerning the material that was elaborated at the shallow level of processing, and which therefore was less likely to be remembered. It also appeared that creative participants show increased tendency to as questions and discern relations during academic learning. Discussions of results pertains to the bottom-up and top-down mechanism of creativity.

Aixiaoxia (2001) : has conducted a study on the, "Creativity and academic achievement : An investigation of gender differences."

Investigated the relation between creativity and academic achievement in 2264 male and female Spanish secondary students (aged 13-18 yrs.) Three creativity batteries were administered, to the students. Teachers were also asked to rate student's creativity Academic achievement was operationalized by students self-reports of their achievement in six subject areas : Spanish, Basque, English, Natural Science, Social Science and Mathematics. The results show that if operationalized by the teacher's ratings, creativity was related to academic achievement for both males and females. For males flexibility
was predominant factor that related to all six academic subject areas. For females, elaboration related to four of the academic subject areas and fluency related to natural science and mathematics. If operationalized by the other three measures, however, creativity was barely related to academic achievement.

Maite Garaigordobil and Esther Torres (1998) have studied, the "Assessment of the relationship between creativity, intelligence and academic achievement."

Investigated the relationship between verbal-graphic creativity and other factors such as intelligence and academic performance using 155, 8-10 yrs. olds. The following instruments were used: Unusual uses, consequences and circles test (Guilford battery), close resistance test (De la Torre), Raven's intelligence test, and academic performance scale. Results show few and low correlations between creativity and the above variables. Significant correlations were found between verbal creativity and academic performance and tendentially intelligence.

Scully Victoria Oakes (1998) has conducted a study on "Processing preferences of high academic achievers and exceptionally creative adolescents."

Statement of the problem: Do students identified as either high Academic Achievers (AA), having High Creative Potential (HCP), both high academic and creative abilities (AH) or a randomly selected control group (CG) use significantly different processing preferences or do they
use common processing preferences? Is there a relationship between selected elements of processing preferences and elements of creativity? Is there a relationship between selected elements of processing preferences and creativity and student's score on achievement test?

Method. This study used 24 processing preferences measured by the learning style profile (LSP), six scores for creative potential measured by The Torrance Test of Creative Thinking (TTCT), and three measures of academic achievement (composite, reading and mathematics) to describe the manner by which 117 students preferred to learn. Thirty four students also participated in interviews. Results: Student's preferences for persistence, memory, verbal risk and emotive response were significantly different for each group. Students from all groups who preferred to recall information in a detailed discrete visual manner and who were more inclined toward introspection rather than action performed higher on the resistance to premature closure scale of the TTCT. Student's preferences for processing and creativity scores did not relate to their achievement test scores. All participants (ages 11-15) preferred or learn in small groups and study in the afternoon, using informal posture, analysis, spatial processing, broad parameters for categorization, sequential reasoning and manipulation. AA students preferred to learn by using persistence, introspection rather than argument, visual modalities, scanning rather than focusing, and leveling to encode and recall memories. HCP students preferred to learn by using
introspection sharpening of memories, scanning and avoid emotive reactions. AH students preferred to learn by using persist.

Joan Freeman (1995) has studied on "Conflicts in Creativity".

Creative thinking involves both emotion and personality, including enough confidence and courage to consider new approaches to problems, rather than hiding in the security of familiar and accepted ways of thinking. There is a conflict in education between the need for emotional control for academic excellence and the need for a more free and open minded approach. Students who were extremely successful academically are often found to be creatively inhibited because of the narrow focus and pressure of their school education. The problem for teachers is to enable intellectually gifted pupils, who have the ability for high academic achievement, to keep a playful, creative approach to their work and general outlook. An environment in which the exceptionally able child can prosper all round must be balanced. This implies enough time with other people to make good social relationships and develop interests outside study areas. Topics discussed include; where creativity starts, the creative cost of high academic achievement, and education for creativity.

Bawa S.K. Parvinder Kaur (1995) have studied on "Creativity and Academic Achievement."

This research paper aimed at (1) finding out the relationship of the dimensions of creativity with the subject-wise academic achievement of
male and female students (2) studying the relationship of composite creativity with the subject-wise academic achievement of male and female students and (3) studying the effect of creativity towards the prediction of subject-wise academic achievement of male and female students and the total sample students were 600, 10th graders who completed a measure of creative thinking. Their scores from their annual 9th class examination served as measure of their academic achievement. Creativity and achievement in language tend to be better correlated than creativity and achievement in social studies and general science. Originality and academic achievement tend to be more strongly associated than academic achievement and fluency and flexibility. Creativity is a better predictor of academic achievement in language than in social studies.

**Junghee Kim and William B. Michael (1995)**: have conducted a study on, "The relationship of creativity measures to school achievement and to preferred learning and thinking styles in a sample of Korean high school students."

Determined the extent to which performance on measures of creativity involving verbal and visual tasks was related to (1) school achievement, as revealed by a quantitative indicator (percentage score), and (2) expressed preference for a given learning and thinking style, as revealed in the style of learning and thinking, intended to portray left (LB) and right (RB), or an integrated left-right brain (LRB) function.
Possible gender differences were also identified. Students were 193, 11th grade Korean high school students (92 males and 101 females). Measures of creativity showed little relationship to school performance. Females exhibited higher average levels of performance on creativity tests than did males. Sc classified as showing an RB dominated learning and thinking style preference earned higher scores on creativity measures than did Ss classified as LB or LRB dominant.

Karen De Moss, Richard Milich and Stephen De Mers (1995) have studied on the "Gender, creativity, depression and attributional style in adolescents with high academic ability."

Examined the relationship among gender, creativity, depression, and attributional style among high achieving adolescents. 128 high achieving students (71 boys 57 girls) in Grades 8 and 9 completed the Torrance Tests of Creative Thinking (TTCT), the Children's Depression Inventory and the Children's Attribution style Questionnaire Revised. There were gender differences only on the verbal component of the TTCT, with girls scoring significantly higher. For both sexes there was a significant relationship between figural creativity and a depressogenic attributional style. However, for girls, high verbal creativity was associated with low levels of depression and a positive attributional style.

Kattami, Haifa et al (1995) have studied "the relationship between creativity and school achievement and other social, economical, and cultural variables on tenth-grade students in Amman city".
The goals of the study were to determine the social, economical and educational variables which distinguish between creative and non-creative students, and to investigate the differences between their scores in academic achievement related to creativity: (1) There are no significant differences among creative and non-creative students, economically, socially or educationally. (2) There are no significant differences between creative and non-creative student’s in terms of their academic scores. The population of the study was composed of the students in the tenth basic grade during the academic year 1990-91, in the public schools of the city Amman, Jordan. Of the sample of 569 students, 294 were male and 275 were female. The sample was selected by using the cluster method, according to gender. Two scales were used for testing the hypotheses of the study, as follows: (1) A situational survey scale of social, economic and educational factors. This scale was developed to fit the Jordanian environment. (2) Torrance’s scale for creative thinking, which was developed and translated to suit Jordan's environment. The findings of the study showed that, there were significant differences at (<0.05 level) between scores of creative and non-creative students related to some social, economical and cultural factors. There were significant differences between mean scores of the creative and non-creative student in the academic achievement.

McCabe Marita P (1991): has studied the “Influence of creativity and intelligence on academic performance.”
Studied the influence of creativity and intelligence on the academic achievement of 126 female students aged 12-13 years and 84 female students aged 14-26 years. Students completed tests and the Torrance tests of Creative thinking, and teacher assessments of achievement were obtained. Results show high creativity scores in both the figural and verbal area were associated with both high test scores in English tests and high assessments in English. To a lesser extent high creativity scores were associated with high exam marks in mathematics and art, but not with high assessment in these students. High creativity was associated with high verbal and quantitative IQ scores. Creativity increased with increasing age. Results suggest that although high levels of creativity may be associated with high levels of academic performance, this role is not a causative one.

Lind S. Toth and Sheldon R. Baker (1991): have studied, “The relationship of Creativity and Instructional style preferences to over achievement and under achievement in a sample of public school children.”

Based on a review of the literature, a study was developed to examine the relationship of creative ability and learning style to scholastic success among 116 students from grades 6, 8, and 10. Students were administered the Torrance Tests of Creative thinking and the learning style, Inventory, and a regression equation was formulated using academic file scores of IQ and Achievement to derive a predicted
achievement test score. 29 students were identified as over achieving and
24 students were identified as under achieving. Results suggest that high
levels of creative ability may interfere with convergent thinking skills:
the more creative student may be less likely to achieve academic success
within the time constraints of a traditional classroom setting

N. Mah Riaz (1991): has conducted a study on, “Creativity and
psychological differentiation in high and low achieving science
students.”

Explored the relationship between academic excellence, creativity,
achievement in science and psychological differentiation using 39
academically superior and 29 below average college students. Students
completed a test of creativity and measures of psychological
differentiation and academic achievement in science. Academically
superior students earned significantly higher scores in all these tests. The
correlations between scores on creativity and science achievement tests
were significant for the academically superior group, but not for the
below average group. Correlations between creativity, psychological
differentiation, and science achievement were insignificant in both
groups.

Giselle B Esquivel, Emilia Lopez (1991): have studied the
"Correlations among measures of cognitive ability, creativity, and
academic achievement for gifted minority children."
Investigated the correlations among nonverbal reasoning ability, creativity, and academic achievement in 160 gifted minority children in grades 1-8 in a program for gifted. Half of the students were tested at the beginning of the year and the remaining half after 7 months with Raven Progressive Matrices, Torrance Tests of Creative Thinking, and the California Achievement Tests. Correlations reflected limited relations among these variables, except for a significant positive value between creativity and reading achievement.

Hall Eleanor G. (1985): has conducted research on “Longitudinal measures of creativity and achievement for gifted IQ groups”.

Investigated the relationship between measures of creativity and achievement among a group of 59, 8th-12th grade gifted students (IQ’s of 130 and above). Students were divided into 3 groups according to the stability or change in IQ that occurred between 8th and 12th grades. Students were tested with the Stanford Binet Intelligence scale or the Wechsler Intelligence Scale for Children (WISC) at least every other year on their birthday, they were also tested on the Torrance Tests of creative thinking. IQ decreasers dropped 6 or more points, and IQ increasers gained 6 or more points. The IQ’s of the stable group changed less than 6 points. Of the 3 groups, the IQ decreasers had the highest creativity scores, whereas IQ stables scored the next highest. IQ increasers were lowest in creativity in 8th grade. By 12th grade, the increasing IQ group also increased in creativity while the stable IQ group
declined in creativity. The decreasing IQ group remained highest in creativity changes in both IQ and creativity were more prevalent in girls than boys. These data support other studies on the relationship between creativity, IQ and achievement.

Starr JW, Nicholl Carroll (1975) have studied on “Creativity and Achievement in Nuffield physics.”

Administered tests of creativity, intelligence and attitude towards science to a group of 110 pupils who were also candidates for the Nuffield ordinary level physics examination. No support was found for the hypothesis creativity would be related to performance in Nuffield physics of which the most important correlate was general intelligence. Verbal and figural creativity emerged as separate factors and verbal creativity was found to be weakly related to verbal intelligence.

Smith I. Leon (1971) has conducted studies on “IQ, Creativity and achievement: Interaction and threshold.”

Based on Torrance’s threshold concept, IQ and creativity measures were expected to be differentially related to tests of convergent and divergent achievement over varying intellectual levels. An IQ test, achievement measures derived from BS Bloom’s Taxonomy of educational objectives; Cognitive domain, and 3 creativity tests were administered to 141, 11th graders. The data were analyzed through the use of multivariate interactive and linear regression models. Results indicate that the relationships between creativity and the 2 types of
achievement are generally linear. Although intelligence is the major variable related to the convergent criteria, creativity, in addition to IQ appeared as a necessary dimension in performance on the divergent criteria. Findings are discussed in terms of the teaching for and measurement of creativity.