CHAPTER-II

REVIEW OF RELATED LITERATURE.

Research or searching again for new aspects of previously attained fact or knowledge in whole new aspect to reveal new application of the previously done researches or study can only be done by keeping a careful and observable eye on previously obtained facts and findings. Along with the human endeavour and creative aspect of researches, a new research always needs a subsequent study or review of previously done studies so that the extent of knowledge which is previously obtained can be taken in consideration before conducting new research in any new aspect setting analogies with the previously done researches.

A new research work can never be done in isolation, ignoring all facts and findings obtained by previous researchers. Thus a careful review related to the proposed study should be done in all sources of information available to the researcher. A deep and careful review of research journals, books, dissertations, thesis and other sources, not only helps a researcher to obtain the previous knowledge of the concerning field but also helps in deciding and plan the steps of research to be taken in the undertaken study so that something new and relevant can be explored with the new research. The review of related literature helps to develop a deep insight and a clear perspective of the undergoing research which minimizes the risk of dead ends, topics rejected in previous researches, topics rejected for researches, wasted efforts, mistake done because of trial and error and the most important irrelevant and effort and time consuming mistakes based on faulty research design which can be guided by the previous analogous study done in the concerning field.

Borg(2007) stated that the literature in any field forms the foundation upon which all future work can be built. If a researcher fail to build the foundation of knowledge provided by the review of literature the undertaken research work is likely to be shallow and naive and often duplicate the work that is already been done better by someone else. The survey of related literature may also provide guiding hypothesis, suggestive methods of investigation and comprehensive data for interpretive purpose of the proposed research(Goods,1963). The review of related literature also include various research objectives rather than only finding the work done in previous year in
the concern field. It also implies deep and tedious procedure various knowledge sources of locating, studying and evaluating reports of relevant researches, study of articles published in various journals, research papers, having a close look on suggestions made for future researches in various seminars, workshops, research thesis etc, an overview of related portion of Encyclopaedia and research abstract, study of related material of well renowned comprehensive books and manuscripts available. For a worthwhile research, which is free from the basic problems of repetition of previous study, duplication and flaws in applying basic research methodology in the research a researcher has to acquire a clear and detailed plan of research methodology and working procedure before starting the research, in which reviewing of what is done previously and method how it was conducted plays a significant role.

Developing the insight of what is done before and how it is done to achieve what objectives helps the new researcher to develop a design and conduct a whole new and worthy research which can solve many related problems of the concern field along with opening the whole new dimensions of something new to do, for upcoming researchers. The important and critical phase of preliminary survey which includes study of previous studies, literature, discussions and experiences related to the research area in which research is going to conduct is a time consuming but fruitful phase of any research design. Some of its specific purposes are as follows:

- It helps the research worker to become familiar to what is already done and the extent of knowledge which is already explored by previous researchers. It also helps to know what others researchers has objectified and what method they have chosen to achieve that objective along with what advantages and disadvantages they have to face in overall investigation and also what precaution and alternatives can be taken in to make future researches more fruitful and purposeful for future generations.

- It acts as the basis of most of the research to be conducted in various fields of sciences and humanities where methodology plays a significant role in achieving planned objectives. It provides basic and preliminary knowledge of each and every aspect of what is conducted
in previous years and on what foundation should all the future research
must develop.

➢ It introduces researcher to the means of getting into the frontier in the
field of the research to which they are going to explore.

➢ Previous knowledge of what is already been done helps the researcher
to contribute something new and purposeful in the field they are
researching on.

➢ Having a detail knowledge of what is done in previous years furnishes
the researcher with the indispensable suggestions on various steps to
conclude the research which includes steps to how to acquire
competitive or descriptive data, proper procedure to conduct research,
alogous methods to find in fruitful results for similar studies and
previous complications in applying traditional techniques and method
to deal with it.

➢ It provides a detailed researches and projects which are in progress in
the related field and also about the latest and advanced techniques
which can be used in to conduct the new research in an effective
method.

➢ Review of previous researches also provides research ideas, theories,
explanations, hypotheses and methodology of research, valuable in
formulating and studying of the problem.

➢ It can be helpful in collecting or acquiring comparative data of the
relevant purposes which can be used with equal relevancy with fewer
efforts providing useful interpretations of the research to be conducted.

➢ The clear and detailed knowledge of what is previously done following
which procedure helps a researcher to develop a much more fruitful
and significant insight to upgrade the research design which is to be
used in taken over research.

➢ It acts as a genuine and foolproof resource to verify what is previously
done in that research concern which helps researcher to avoid pointless
and useless repetition of researches.

Considering the importance of review of related literature researcher has
reviewed various research materials provide to him by various resources like survey
of previous research, research journals, research abstracts and Encyclopaedias available in different national level libraries, universities, Educational Research Centres etc in the relevant field. Theoretical foundations of the scientific researches conducted so far constituted significant base for the present study. Keeping in view the various requirement and need to review the existing literature on scientific creativity, creativity, intelligence, personality and study habits correlates researcher tried to collect available data from any source available to him. While reviewing the research literature is following points were primarily taken under consideration to collect relevant research review:

- Relevant studies conducted on Scientific Creativity.
- Studies on relevant cognitive correlates of Creativity.
- Relevant study on Scientific Creativity and Intelligence correlates.
- Relevant study on Scientific Creativity and Personality correlates.
- Relevant study on Scientific Creativity and Study Habits correlates.
- Comparative studies on any of the two psychological domains specified.
- Studies conducted in relation to any of the mentioned cognitive domain of students particularly adolescence.
- Predictive studies conducted in any of the defined domains.

Keeping in view the above mentioned points and in searching related literature, the researcher has noticed certain important elements also. Various factors like creativity, scientific creativity, intelligence, personality, learning styles, study habits etc are taken in major or in partially correlated variables, to study the relation with the prime variables (i.e. Scientific Creativity, Intelligence, Personality and Study Habits) of the study. Researcher has included reports of closely related studies that have been investigated, design of the study including procedures employed and data gathering instruments used, populations that were sampled and sampling methods, variables that defined, extraneous variables that could affect the findings, faults that could have been avoid and recommendations for further research. After considering the above precautions researcher reviewed the literature in following two heads,

- Researches conducted in foreign countries.
- Researches conducted in India.
Only those studies that are plainly relevant, competently executed, and clearly are reported are considered to be included in this section which are completely or partially correlated to an extent to the present research.

2.1 RESEARCHES CONDUCTED IN FOREIGN COUNTRIES

Galton(1869,1874) is perhaps one of the forerunners to initiate empirical research on the problem of creativity-personality relationship. He founded geniuses and eminent men to be distinguished by the originality of their ideas i.e. fluency and freedom of their associations. In a similar study on men on genius in Britain with a special reference to psycho-pathology, Ellis(1904) observes the incidence of psychosis among them to be no greater than in a general population.

Guilford(1950) defined creativity on the basis of ‘convergent thinking’ and ‘divergent thinking’. Getzels and Jackson (1962) and Torrance (1963) also argued that conventional intelligence tests are only useful in the measurement of convergent thinking and not of divergent thinking.

Guilford(1950) predicts that the relationship between intelligence and creativity is low. This fact has been investigated through various correlational studies. Getzels and Jackson (1962) report low correlations ranging from 132 to 378 between creativity and intelligence. From this, it can be inferred that creativity is slightly related to intelligence and as such it constitutes a separate cognitive factor which contributes little to conventional intelligence. It may, however, be pointed out that in Getzels and Jackson's sample, the high creative group which was selected in such a way as to exclude students of really high IQ still had an average IQ of 127.

Munsterberg and Mussen(1953) studied the personality structure of art students in their attempt to test the hypothesis derived from psycho-analytic formulation. They found artists to have guilt feelings, traits of introversions, a richer inner life and an unwillingness to comply to their parents in childhood as compared to their non-artists.

Cattell(1954, 1968) concluded after analyzing biographies of scientists that scientific researchers are generally found with the personality characters like schizothyme, withdrawn, sceptical, internally pre-occupied, precise and reliable. The
average level of ego-strength and emotional stability is distinctly higher for the effective scientific researchers than for the general population. They are also found to have high anxiety level, high irritability and excitability. They are desurgent as compared to artists, businessmen and others.

**Terman (1954)** in two contrasted groups of men rated highest and lowest for success in life in terms of the extent to which one has made use of one's superior intellectual ability. He founded that the high group characterized by a well balanced temperament and freedom from excessive frustrations and is significantly different from the low group with a drive to achieve an all-round mental and social development.

**Barron (1955)** concluded that the mean differences is significant between originals and unoriginal on the p-trait of preference for complexity, psychodynamic complexity as a person, independence of judgments, CPI Social dominance, and self-rating dominance

**Cattell and Drevdhal (1955)** added some interesting findings to offer to this picture of creative scientists. He founded them highly intelligent, independent of mind and dominant as well sensitive in psychological sense. But in comparison to the general population, these scientists were found to be introspective, reversed and cool, that is they tended to be outwardly inhibited, serious and taciturn and self sufficient to a degree which is reflected.

**Cattell and Drevdahl (1955)** observe the research scientists to be significantly high on factors of schizothyme (Factor-A) and self-sufficiency (Factor-Q2) as contrasted with a college group of administrators. The difference in schizothyme and self-sufficiency have also been noticed in a comparison of creative and non-creative students in science and arts subjects respectively by Dravdahl (1956), but no significant difference is found in between the creative and non-creative groups, existing on the factors of intelligence versus mental defect, ego-strength versus lack on internal standards, adventurous cyclothymia, withdrawn schizothymia, emotional sensitivity versus maturity, bohemianism versus practical concernedness, sophistication versus simplicity, anxious insecurity versus self-confidence and will control and stability versus nervous tension.
Kubie (1958) is of the view that preconscious system is essential implementation of all creative activity. Analyzing a number of case histories, he concluded that neurosis corrupts, distorts and block creativeness is in every field of human endeavour. Basing on his study on Psycho-analytical theory, Myden (1959) tried to identify and evaluate certain personality character of individuals of recognised creativity and compare them with the personality characteristics of a group of business and professional people. These findings may be interpreted in a way as to support Freud’s (1949) notion that creative persons have easier success to primary processes and therefore less repression and more psychic energy.

Cattell (1959) on the basis of an investigation on 144 physicists, biologists and psychologists tends to arrive at three important conclusions that the personality profile of these researches differs significantly at 0.01 level from that of average man in as much as that they are more schizothyme, intelligent, dominant, inhibited, emotionally sensitive and radical and they are more given to controlling their behaviour by an exacting self concept. The researcher's personality profile differs from those of persons of equal general intelligence who are outstanding in administration and teaching in the sense that former are schizothyme, emotionally less stable, more radical and uniformly lower on all primary personality factors of extroversion and finally, the researchers profile when compared with those of persons eminent in literature and decorative arts are found to be more schizothyme, intelligent, dominant, desurgent, radical and self-sufficient than their average counterparts.

Guilford (1959) concludes that individuals high on scores of fluency tend to be more impulsive, more ascendant and more confident. They show strong appreciation for creative products. Those who score higher on tests of expressional fluency incline to be more confident and tolerant of ambiguity and demonstrate liking for reflective and divergent thinking.

Guilford (1959) remarks that the Roe's (1946, 1951) studies of leading scientists manifest one temperamental trait to be universal - a willingness to work hard and to work for long hours. He, however, points out that there is no indication to any unique relationship between this trait and creativity.

Wall (1960) proposes that creativity is likely to spring from a well stored
mind and high intelligence as well as fineness of perception are the essential conditions for that fruition.

Jamuar(1961) in his research investigated the relationship between some personality variables and achievement, further it was intended to find out whether personality factors affected achievement independently of intelligence and concluded that achievement depended on personality adjustment of pupils, among different dimensions of adjustment, home, emotional and social adjustment played a vital role and introversion.

Burt (1962, 1964) argues that there is no agreement among the psychologists to the issue, whether there is a separate ability as creativity. He points out that creative production may be attributed to general ability in the tradition of Galton (1883), rather than differences on separate and distinct intellectual skills. Thorndike (1963) and Marsh (1964) fail to obtain clearly defined I.Q. independent factor of creativity and where such factors have been obtained.

Getzels and Jackson (1962) in their sample of twenty-six high creative and twenty-eight high intelligent adolescents performed study on the basis of their performance, I.Q. and summated scores on five creativity instruments, the high I.Q. students using stereotype meaning and conventional standards of success and aspire for unconventional careers. Creative group is also characterized by wide ranging interests, sense of humour, emotional stability etc.

Torrence (1962) lists eighty-four characteristics collected from an extensive review of literature which differentiated highly creative persons from the less creative ones. The checklist has been the basis for such subsequent work on refining the concept of creative personality. Commenting on the issue of relationship between creativity and intelligence, Foster (1971) points out that it centres around two focal points viz. creativity which is proposed to be a distinct aspect of intellectual functioning and is practically independent of conventional intelligence and Creativity which depends upon the unique cognitive factors which function within the hierarchical structure of intelligence (Vernon, 1950).

Taylor and Barron (1963) present summary of collection of papers originally presented at the three Utah conference on scientific creativity which reveal
comprehensive results as reported by sub-groups studying environmental conditions, motivation and personality traits.

Torrance (1963) in his partial replications of above study does not find significant difference in the achievement of high creative and high intelligent group in six out of eight such replications. Even in this case the groups were highly selective, representing a small ability range of the upper twenty percent on either of the creativity of IQ groups.

Lait (1964) also supports the results obtained from Getzels and Jackson's study. Ripple raised by Getzels and Jackson was assured with their results do not conform to the view that creativity is an entity independent of other facets of human intellect.

Dauw (1965) conducted a comprehensive study involving high school students by Torrance Test of Creative Thinking. He differentiated between the two types of highly creative high school seniors, those scoring high on originality and those scoring high on elaboration. All of the high groups were differentiated from the lower group by their total score on creative- personality check list who tended to set high standards and goal for themselves more often than the high elaborators.

Cropley (1965,1966) concludes that the two skills represent overlapping aspects of the intellect which probably interact in creative production and as a high result, high scores on divergent production are accompanied by high scores on convergent productions though the two aspects of intellect are not identical. Cave (1970) investigated the creativity-intelligence relationships with promax factor rotation scheme and identified factors representing creativity, verbal relation and non- verbal reasoning.

Limberman (1965) explored the hypothesis that there is relationship between the quality of playfulness in young children’s behaviour and fluency, flexibility and originality. She tested 93 kindergateners orally and individually with the Product Improvement Test on five aspect of playfulness, physical, social and cognitive spontaneity, manifest joy and sense of humour. She found by using centroid factor analysis that playfulness to be a unitary behaviour dimensions that correlates significantly with creative measures.
Ya'walkar (1985) on his study of personality correlates with scientific creativity concluded that the bionics group had shown positive gains on four personality variables i.e. emotional, dominance, superego strength and self-reliance and negative gains on one variable of venturesomeness. The morphological analysis group had shown positive gains on three variables i.e. dominance, superego strength and venturesome and negative gains on two variable of emotional and self-reliance.

Russell and Petrie (1992) cited a research study, aimed at finding out the relationship between study habits and student attitude including academic performance (based on cumulative GPA) of students. The findings of this study indicated a positive correlation between study attitude, study habit and academic achievement.

Struthers et al. (1996) in their study examined the relationship between student’s attributions, action control and creativity and their subsequent motivation and achievement which concluded that the levels of action control and creativity in the unstable attribution condition translated into significantly different grades in student’s introductory psychology course which on basis of motivation were either state-oriented and low in creativity or state-oriented and high in creativity, produced lower course grades compared to action-oriented, highly creative students.

Behroozi (1997) studied the multiple relations in between personal features and creativity among 187 university students through Cattell questionnaire of Creativity. The result showed no significant relationship between creativity and others mentioned variables.

Karimi (2000) in his research on creativity, sex and academic achievement among secondary school students, found significant relationship among these variables which can be summed up as, there is a 25 relationship in level (p<1%) between total creativity and academic achievement. Also, the comparison between girls and boys in creativity is indicative of the significant difference between these two sexes. The boys are strikingly excelled the girls in creativity.

Nori (2002) in her study studied relationship between creativity and other factors of high school students in Shiraz city. Creativity was measured by using Abedi questionnaire and CGPA to assess academic achievement of students. The result was
analyzed on the basis of CGPA for academic achievement. It revealed that there is no significant relationship between creativity and academic achievement but there exist a significant difference in resultson the basis of sex difference.

Riazet-al (2002), conducted a study, aimed at determining the effect of study habits on the achievements of students and concluded that there existed a significant and positive relationship between achievement and a proper study schedule.

Imtisunga (2003) in their study examined the intelligence of test scores of the students and classify them in terms of IQ’s on the basis of statistics along with other functional variables to compare normal and underachievers to study the impact of IQ as well as achievement motivation on the academic success with other aims and concluded that the scores of correlation co-efficient were found positive in all cases but not at high level, the correlation co-efficient between all variables were very low, some students with high IQ’s primarily.

Aitken (2004) in its study examined 404 on four scales of a time, group administration, intelligence, 10 personality scales and a creativity measures. Finding of this study showed that academic achievement has been found small to moderate having positive correlations with intelligence factor.

Aluja and Blench (2004) in their study analyzed the relationship among cattellion personality factors, scholastic aptitudes, study habits and academic achievement and found that personality traits had a low direct contribution to academic achievement and higher students on socialized personality traits showed better study habits than students with lower scores on personality socialization traits. The relationship between personality and academic achievement seems to be mediated by study habits.

Ethan, Elliott Hodge (2005) conducted a study on a best- evidence synthesis of the relationship of multiple intelligence instructional approaches and student achievement indicators in secondary school classroom which concluded that there is a very limited amount of research focusing on the relationship of multiple intelligence instructional approaches which vary widely in methodology and implementation but demonstrate a fairly consistent philosophical approach.
Varte et al. (2005) studied intelligence and academic achievement in relation to parent child relationship with the objective to study the influence of parent child relationship on intelligence and academic achievement of high school students and on 450 students found that no gender difference on intelligence, academic achievement and parent child relationship existed in between students of high school level.

Bratko et-al (2006) in their study assessed personality with school grades in 255 (88 male and 167 females) Croatian pupils and founded that conscientiousness was the strongest personality correlate of school grades for both self and peer-rating. Self assessed Extraversion and Emotional stability, peer ratings of autonomy have a significant effect on personal development of students. When cognitive ability was partialled out, correlations between personality and school grades showed little change, indicating that the effects of personality on academic performance were independent of intelligence.

Dearyet-al (2007) found that there was gender difference in educational attainment of students in their academic achievement. Girls performed better than boys on overall academics subjects (courses). There was also significant gender difference in all academic subjects (courses) scores, except physics where girls performed better in every topic except in physics.

Oyundoyin and Olatoye (2007) reported that there was no difference between male and female students on general creativity tests. There was also no significant difference between male and female students on each component of creativity namely fluency, originality, flexibility and creativity motivation. They recommended that neither men nor women should be discriminated against in tasks that require demonstration of creativity.

Kaia et-al (2007) in their study investigated the intelligence, personality and other correlates from elementary to secondary level using SPM which was administered without time limits and followed by the personality questionnaire and concluded that the prominent role of intelligence and conscientiousness in predicting academic achievement agrees with the common sense notion that any kind of success is a result of ability and effort of students. (Gagne and St Pere, 2001).

Laidra et-al (2007) in their study researched on intelligence and personality
traits from the five-factor model were studied as predictors on different criteria and concluded that openness, agreeableness and consciousness correlated positively and neuroticism correlated negatively with GPA, in almost every grade. When all measured variables were entered together into a regression model, intelligence was still a strong predictor of GPA consistently marked in all grades.

Zhang (2007) in his empirical study considered two longstanding controversial issues in the field of intellectual styles on distinction (or similarity) between various style and constructs. The second relates to whether or not intellectual styles make a difference to student’s achievement, and investigated the relationship in between Torrance’s modes of thinking and Sternberg’s thinking styles and concluded that each of the two style constructs has a unique value in explaining individual intellectual differences in human performance and makes another call for cultivating creative intellectual styles among school students.

Naderi et al (2008) found there was no gender difference on creativity as the whole. However, the findings revealed gender differences in subscales scores. According to this result, females scored higher than males in the initiative factor, while males scored higher than females in the environmental sensitivity factor. There is also no significant difference between male and female students academic achievement.

Naderi et al (2009) reported in their study that neither intelligence nor creativity act as a significant predictor of academic achievement among undergraduate students of Iran assessed using CGPA scores as measures of student achievement. Gender difference in academic achievement seems to vary depending on the school subject or course being considered in the study.

Batey et al (2009) in their two studies examined the relationships between measures of intelligence, personality and divergent thinking (DT) in student investigated the incremental validity of measures of IQ and fluid intelligence with the Big Five Personality Inventory with regards to DT and concluded that significant relationships of DT to fluid intelligence, Extraversion and Disagreeableness were observed. While study two investigated the incremental validity of measures of fluid and crystallized intelligence (as assessed by a test of general knowledge) with the Big
Five Personality Inventory with regards to DT. The nature of the relationships of IQ, fluid and crystallized intelligence, in addition to personality traits to tests of DT were considered.

**Furnham et-al (2009)** in their studied interrelation in between personality traits, intelligence and other variables and by a series of hierarchical regressions were performed on intelligence and personality test scores on various other criteria and concluded that the overall grade intelligence accounted for a fifth of the variance and personality an incremental validity of 8%. Whilst a combination of intelligence, personality and sex accounted for around a quarter of the variance on different criteria useful in terms assessments of candidates in their selection.

**Sarwar et-al (2009)** in their study aimed to study-orientation of high and low academic achievers on gender and residential criteria. By the tool used in the study was orientation (including study habits and attitude) questionnaire which was developed on the lines of Brown and Holtzman (1967), Ansari (1983) and Ansari and Chowdhri (1990). They concluded that the students who have better score on study-orientation tend to have better academic achievement. This difference is highly significant on subcategories like study habits, study attitude, delay avoidance, work method, attitude towards teacher etc. The difference between boys and girls was not significant at 0.05 levels and the difference between rural and urban students was significant on the factors of study-orientation, study habits, etc. in the favour of rural students.

**Silvia et-al (2009)** in their study entitled ‘A Snapshot of Creativity: Evaluating a Quick and Simple Method for Assessing Divergent Thinking’. In study they concluded that creativity assessment commonly uses open-ended divergent thinking tasks and compared snapshot scoring to top-two scoring, a time-intensive, detailed scoring method of college students (n=226) completed divergent thinking tasks and measures of personality and art expertise. Top two scoring had larger effect sizes, but snapshot scoring performed well overall. Snapshot scoring, thus appears promising as a quick and simple approach to assessing creativity.

**Batey et-al (2010)** in their study sought to examine the contribution of fluid intelligence, general knowledge and Big Five personality traits in predicting four
indices of creativity Divergent Thinking(DT), fluency, Rated DT, Creative Achievement, Self-Rated creativity and a combined Total Creativity variables. When creativity was assessed by DT test, the consistent predictor was fluid intelligence. When creativity was assessed in terms of achievement or self-rating, personality variables were consistently predictive.

Habibollah et al (2010) in their study investigated to find out the relationship between different aspects of intelligence and other aspects on gender differences regarding the relationship between different aspects of creativity and academic achievement. Major findings of the study were that there is no different aspect of intelligence and academic achievement which do not matter for males and females when looking at the relation between intelligence and academic achievement.

Furnham et al. (2011) conducted two studies used multiple measures of creativity to investigate creativity differences and correlates in arts and science students on criteria of Divergent Thinking fluency, Self-Rated Creativity and Creative Achievement in matched groups of Art and Science students and found that arts students scored higher than science students on two of the three measures. The second study compared students on two performance and two preference measures of creativity, whilst controlling for the effects of general intelligence which indicated significant group differences, with the regression analysis only of Self-Rated Creativity, suggesting a stronger role of personality variables.

Ghaziet-al (2011) conducted a study on ‘Relationship between student's self perceived multiple intelligences and their academic achievement.’ The study aimed at investigating the relationship between student's self perceived multiple intelligences and their academic achievement. A significant correlation was found between self perceived verbal/linguistic, logical/mathematical, interpersonal, intrapersonal, naturalistic intelligence etc. There was insignificant correlation between different intelligence and academic achievement. Results of the study showed that the relationship between self perceived bodily/kinaesthetic intelligence and academic achievement was very weak.

Khataybeh et al (2011) conducted a study on multiple intelligences with some variables like gender, university (public or private), the student's averages, the
student’s specializations and the academic year. Results of the study indicated that interpersonal intelligence is the highest and the most common intelligence among Jordanian students. There were significant differences among Jordanian students in the linguistic and interpersonal intelligence in favour of the females. There were significant differences in the logical intelligences in favour of the governmental universities. There were no significant differences in the multiple intelligences that can be attributed to the averages of the students.

**Steinmayr et-al(2011)** investigated the joint influence of goal orientations, intelligence, and personality on school performance in their study on Intelligence, which was estimated with the help of Big Five factors of personality inventory with other variables and concluded that when school performance was regressed on all variables simultaneously, intelligence, Openness to Experience, Conscientious, and learning goals predicted school performance.

**Rana and Kausar (2011)** in their study assessed student’s study habits and their last year academic grades were used to assess academic performance on their race and statistical analysis revealed that although White British students had significantly better in study habits than the Pakistani British but no significant difference was found in their academic performance. Country of origin and schools had significant interactive effect on study habits of students but it did not have an interactive effect on academic performance of the students. The study has important implication for the educationists.

**Smrtniket-al(2011)** studied personality traits as a predictor of academic achievement. The study examined the predictive value of adolescent’s personality trait ratings by different groups of informants in explaining academic achievement, while controlling for student’s sex and their mother’s education. Results of the study indicated that adolescent gender predicts very small portions of variance in Grade Point Average at the end of elementary schooling and in the second grade of secondary school. Conscientiousness was demonstrated to be the strongest single personality traits predictor of adolescents.

**Hazratiet-al(2012)** examined the effect of personality traits on academic motivation and academic performance. Result showed that conscientiousness
predicted both of intrinsic and extrinsic motivation, but openness to experience predicted only intrinsic motivation. It was found that academic motivation mediated the relationship between openness to experience and conscientiousness with academic performance.

**Moses C. Ossai (2012)** in his study, ‘*Age and Gender Differences in Study Habits: A Framework for Proactive Counselling against Low Academic Achievement*’ studied Study Habits of Nigerian students with Study Habits Inventory on the basis of age and gender using t-test statistics. Results indicated that a significant differences in the study habits of the students on the basis of age and gender. Study habits seem to improve with age and female students reported better study habits than males. This implies that proactive counselling against poor study habits should start at the basic level of education and diligent attention should be given to male students.

**Akagh (2013)** studied influence of study habits on academic performance of Junior high school students in the Gomoa and concluded that despite other dimensions of study habits examination, homework and assignment, reading and note-taking, concentration, only time management explains the bulk of the variables that predicts student’s study habits. It was found that male students used examination, homework and assignment, reading and note-taking, concentration and time management related study habits more than their female counterparts. Study habits were found to be significantly related to all socio-economic variables (such as sex, age, parent’s level of education, father’s and mother’s sector of education) of a student.

**Ayodele and Adebiyi (2013)** in their study examined study habit as a determinant of academic performance of undergraduates in Nigeria on basis of faculty and gender influence on their study habit. The descriptive analysis revealed that self concept was very strong determinant of study habit, so also was method of study, family background, socio-economic status, peer group and course of study. Again, gender was found to have no significant difference on students’ study habit while on the other hand faculty of students had a significant difference on their study habit.

**Ghaziet-al (2013)** investigated relationship between student’s personality traits and their academic achievement of students by Big Five Personality Trait Theory (Cattell’s and Eysenck’s 1973). Results of the study revealed that no significant
relationship was found between the student’s personality traits and their academic achievement.

Mendezabal (2013) investigated the relationship of student’s study habits and attitudes and their performance in licensure examination. Results of the study showed that the participants do not have favourable study habits and attitudes. Among the noted unfavourable study habits were inefficient time management, lack of time planning and concentration in their studies, poor skills in reading, ineffective test taking techniques and failure to inform their teachers of their difficulties with school work and ask for their help.

Nye et-al (2013) conducted a study in which Big Five personality traits are associated with academic performance among a sample of Russian university students using results from the Unified State Examination (for university admissions) and their current grade point averages as measures of their performance. Results indicated that introversion, agreeableness, neuroticism and openness to experience had observable ties with academic performance.

Anna(2014) in their analysed the relationships in between the Big Five personality traits and tertiary academic performance of the students which concluded that GPA was found to correlated significantly with Agreeableness, Conscientiousness, and Openness, among which, Conscientiousness was the strongest predictor of GPA by far with a weighted summary effect of 0.26 from personality variant.

Jauk, Benedek and Neubauer (2014) provides evidence of the relationship in between intelligence and creativity, particularly creative achievement in their study. In the study researchers of 297 subjectstheir inventory assesses creative activities and achievementsin eight different domains, including literature, arts and science. Researchers using a latent variable structural equation model of creativity and intelligence, concluded on the support for the proposition that intelligence is important for creative achievement, it takes intelligence to convert creative activities into creative achievements.

Julie et-al(2014) in their study examined the congruence effect in academic achievement and personality with other factor on different academic areas in their
personality characteristics, mental abilities, and vocational interests and concluded that the personality, vocational interests and academic major acts as a predictor of academic outcomes on the criteria of grade point average, satisfaction and change of major etc.

**Mathias et-al(2014)** in their study described the intercorrelational aspect of Intelligence and creativity which are known to be correlated constructs sharing a common cognitive basis. The study assessed the three specific executive abilities viz. updating, shifting, and inhibition of sample consisting adolescence and above and examined their common and differential relations to fluid intelligence and creativity (i.e., divergent thinking ability) within a latent variable model approach. As expected, fluid intelligence was strongly predicted by updating, but not by shifting or inhibition. Moreover, updating (and the personality factor openness) was found to explain a relevant part of the shared variance between intelligence and creativity.

**Annaet-al(2015)** in their study explores ‘personality–performance research’ and include personality assessment of 1067 students by Big Five personality test. Significant group differences in all Big Five personality traits were found between students in different academic groups and variability in predictive validity of the Big Five personality traits and facets was found between different academic majors, $R^2$ varied from 0.05 to 0.15 for the Big Five personality traits and from 0.16 to 0.57 for the Big Five facets. Complex patterns emerged, several Conscientiousness and Openness facets were good predictors of GPA in some groups.

**Carmen et-al(2015)** in their study discussed the effect fluid intelligence on various other criterias of school students. The results indicated a positive relationship between PISA and SPM, although a stronger correlation was observed as aggregated and there was variability among schools regarding school performance (35.2%) and intelligence (6.3%) which was not explained by the covariates and random effects. Investigation also discussed the impact of these results on education policies of the area concerned.

**Lars et-al(2015)** in their study explored the educational and vocational careers of adolescents with special needs. The sample consisted of female participants in the lowest IQ group particularly. Different inferential conclusion were inferred with the
help of multiple regression analyses, which, for instance, showed that, within the low IQ group and controlling for confounders, the only significant predictor of career outcomes was educational motivations.

Mislav et-al (2015) in their study conducted on adolescents from 7 to 18 years, investigated with the inter-relations between different cognitive variables including fluid intelligence with the adolescent subject specific outcomes. Relations between processes were explored by several types of structural equation models applied in different age groups and a powerful common general factor underlying all processes at both testing waves in all three age phases was found which also emphasized on implications for developmental and differential theories of intelligence in the study.

Saskia et al (2015) in their study on various dimensions of Intelligence and creativity on two separate cognitive faculties assessed differently and concluded that, generally intelligence focuses on finding the correct solution while creativity on generating new approaches. The study explored the advanced view emerged by study and concluded that they play complementary roles and may be more related than research recognizes. Using task related alpha synchronization, it demonstrated that intelligence integrates with creativity in a problem solving process evolving in open problem space which defines its research importance to explore the way to an approach to cognition where intelligence-related abilities are studied to maintain adjustments.

2.2 RESEARCHES CONDUCTED IN INDIA

Bhaduri (1971) in his study objected to find out the similarities and differences between the overachieving and underachieving students in respect to personality, sex, grade and academic courses and to make a comparison between the two groups over several psychological characteristics which revealed that overachieving students tended to be less anxious than the underachievers, the group difference was in favour of the overachievers on social service and outdoor interest. Overall overachievers showed higher scores on study habits along with various other variables of study.

Dutt et-al (1972) in their study, framed objectives of finding relationship in some factors of personality traits and intelligence of students. Study founded that
Intelligence and academic achievement are highly correlated variables, but they may serve as effective predictors of the other dimensions of the personality in view of the absence of a high correlation amongst them, Neuroticism is to a little extent helpful in academic achievement and Intelligence is relatively independent of personality traits. It is related to introversion only and that too, but very slightly.

Goyal (1973) studied some personality correlates of creativity among school related individuals aiming to investigate into the sex difference of personality in creative individual and also to explore personality factors that discriminate between the high creative and low creative groups. Out of the 16 factors of personality only one factor of intelligence was found to be discriminating between the criterion groups, the high fluent group scoring significantly higher than the low fluent group.

Joshi (1973) conducted a study of creativity and personality traits of the intellectually gifted high school students aiming at studying creativity and personality traits of intellectually gifted high school students in respect of sex and age differences and also attainment standards. He attempted to correlate certain variables of personality with that of creativity. Researcher founded positive and significant relationship between different creativity scores and different personality traits.

Menon (1973) in his study aimed to find out the relationship existing on various criterias of personality, extroversion-introversion, tolerance, maladjustment, masculinity-femininity, academic interest, general ambition, persistence, and endurance and areas of interest like outdoor, aesthetic, scientific etc and concluded that overachieving group of boys and girls of superior ability as well as general group were found to be less socially active and masculine, overachieving group of boys and girls of superior ability as well as general group was found to show greater academic interest, endurance and greater persistence. Overachieving girls from general group and overachieving boys of both groups were also found to have greater general ambition.

Reddy (1973) conducted a study on certain psychological factors to estimate relationship between academic achievement in student’s intelligence, need achievement, personality, home environment etc concluded that socio-economic status and personality factors E, F, O and Q2 were not significantly related to achievement in
any subject or group of subjects. The variables of parental value on education, emotional climate in the home, parental encouragement, educational facilities in the home, n-Ach, intelligence and personality factors of the 16 PF, namely, A, C, G, H, F, L, M, N, Q1, Q3, and Q4 were found to be significantly associated with achievement in one subject or the other.

**Abraham (1974)** in his study considered primarily psychological variables like study habits, attitude towards academic work, sex, age etc along with many other psychological variables concluded that findings of the study were the achievement level was associated significantly with study habits, attitude towards English, personal adjustment, socio-economic status etc with the greater proportion of normal achievers among girls as against boys.

**Rai (1974)** in his study undertook intelligence and scholastic achievement along with many psychological aspects like scholastic achievement and adjustment, scholastic achievement and anxiety etc and also establish regression equation to conclude that intelligence factor along with other psychological factors drove students into academic activities and need achievement where intelligence was found to be as differential personality correlates of individual.

**Chaudhari (1975)** in his study focused on factors like study habits and personality primarily. It was assumed that the factors contributing to academic under-achievement, viz, Study Habits, Personality structure and environmental conditions, were interrelated. Major findings of the study were that study habits of achievers differed significantly from under-achievers, a correlation between the study habits score and the index of achievement was quite high in the case of the male candidates, achievement motivation of bright achievers was higher than that of under achievers.

**Gakhar (1975)** in her study tried to explore the intellectual and personality correlates of creativity. The main theme of her study was the investigation whether creativity and intelligence are two distinguishable modes of thinking or they are overlapping mode of the same intellectual functioning. It was proposed to see whether creative behaviour can be explained in relation to specific constellation of certain personality characteristics that go with it.

**Seetha (1975)** in the study undertook various psychological and social
factors like Intelligence, mental ability, Personality, Study habits etc assumed to affect academic achievement and concluded that study habits have significant a positive relationship with academic achievement, in that high achievers possessed good study habits while as low achievers had poor study habits. But in case of achievers and non-achievers there was no significant relationship between academic achievement and study habits. Out of sixteen personality factors, three factors namely A, B and L were found to be significantly correlated to academic achievement of students.

**Beedawat (1976)** in the study researched on the primary variables like intelligence, personality, motivation, study habits etc by partial correlational method having objectives of to study the incidence of academic underachievement among students of class IX on different criteria. Major findings of the study indicates that the intensity of incidence of underachievement was more or less uniform in the urban and rural areas, the incidence of underachievement was higher in science group, the proportion of underachievement among girls was larger than that among boys comparing various psychological aspects of the study.

**Ghuman (1976)** in study partially highlighted and predicted personality factor with other psychological variables of students. The prime objectives of the study was to find out the difference in the personality traits, aptitudes and achievement motivation of overachieving and underachieving students with regards to sex, academic streams and residential background, major findings of the study were, that no significant differences in achievement was observed within any of independent variables, namely, personality traits, aptitudes, achievement motivation regardless of gender criterion.

**Bhattacharya (1978)** in his study based on a verbal test of creativity in Hindi, aimed to measure the interaction of fourteen personality factors of HSPQ and creativity on the achievement of students of Classes IX and XI, to measure the interaction of thirteen personality factors of HSPQ and creativity on intelligence as measured by factor B of HSPQ of students of Classes IX and XI and to find out their relationships with composite creativity, fluency, flexibility and originality scores, to find out the differences between high, average and low creatives on fourteen personality factor scores and to draw their personality profiles, and to find out the personality correlates of creativity for those in Classes IX and XI. The major findings of the study were that there was no interaction of creativity and the fourteen
personality factors of HSPQ on the achievement of students of classes IX and XI, factors C,G,H,Q and creativity interacted to affect the intelligence of those in classes IX and XI, levels of personality factors did not affect intelligence, levels of creativity did not affect the intelligence of the students, levels of any of the fourteen personality factors did not affect the achievement of class XI pupils.

**Tripathi (1978)** studied the relationship between personality along with other significant variables of academic achievement concluded to the result that Intelligence is positively correlated with socio-economic status and negatively with anxiety and neuroticism in a significant manner. Personality variables, either taken together or taken with one or both concomitant variables contributed significantly towards the prediction of the three-criterion variable taken in the study.

**Bhargava (1979)** found that creativity is significantly related with personality variables like anxiety, independence, education, and occupation while alert poise, extroversion and family size are negatively related. Age and income showed no relationship with creativity.

**Jhag (1979)** conducted a study to explore scientific creativity at the higher secondary level, to explain scientific creative behaviour in terms of specific constellation of certain personality correlates and to see whether creativity could be better understood within the cognito-personalological context primarily. The findings of the study were Scientific creativity was normally distributed in students on various criteria, the urban students were superior to the semi-urban students in the terms of scientific creativity. The creatives and non-creatives students did not differ significantly on Personality Factor A (reserved vs. outgoing). The male and the female subjects had more or less similar personality styles in respect of the reserved versus outgoing trait. Students on various background did not differ significantly in personality styles, particularly on the reserved versus outgoing trait. There was significant contribution of scientific creativity to the variance in Factor B (concrete thinking versus abstract thinking). Creative students were significantly better in abstract thinking, emotional stability, independence, self-sufficiency, self-concept and intelligence and were more venturesome, relaxed, controlled and doubting. The creative boys were found to be more adventurous while the creative girls were shy, timid, restrained and sensitive to threat.
Muddu (1980) conducted a study to investigate the relationship of certain variables to creativity which was positively and significantly correlated with intelligence. Creativity was found to be having highly significant relationships with fluency ($r = 0.859$), flexibility ($r = 0.675$) and originality ($r = 0.777$). Relationship between intelligence and fluency ($r = 0.124$), flexibility ($r = 0.114$), and originality ($r = 0.125$) were positive and significant. The association between creativity and creative abilities was stronger than the association between creativity and intelligence although personality characteristics totally differed from those of the low creative group.

Shivappa (1980) in his study objected to investigate the relationship between the predictor variables such as study habits, personality, self concept, adjustment, manifest anxiety, socio-economic status etc of high school pupils concluded that study habits, educational aspiration, socio-economic status, n-achievement, and IQ were significant positive correlates whereas factors that contributed to predicting to academic achievement were IQ, n-achievement, manifest anxiety, educational aspirations and study habits, intelligence made the maximum contribution and n-achievements the next.

Kishore (1981) in his study attempted to investigate and identify creativity in pre-adolescent children at the secondary school stage on basic criteria of age continuum (and also education) and to explore the relationship between creativity and personality structure. The major findings were in scores for creativity and personality characteristics of various grades indicated that during Classes VI to VIII divergent traits of personality stable, excitable, assertive, happy-go-lucky, venturesome, doubting, self-sufficient, expedient, tough minded, placed, undisciplined and relaxed and were found consistently associated with all the creativity measures. In the later classes IX-X, convergent personality traits different from those listed above (except intelligence) were found highly correlated with all the creativity measures.

Chopra (1982) in his study tried to identify the variables having positive relationship with academic achievement and to find out the relative importance of intelligence and various non-intellectual variables in determining academic achievement concluded to the major findings of the study were study habits were positively related to academic achievement of students and students from higher socio-
economic classes had higher educational and occupational aspirations, a larger number of students from higher socio-economic classes did some planning for a future career in life.

**Kausar (1982)** conducted a study as an exploratory attempt to investigate the relationship of curiosity to intelligence, creativity, extraversion and neuroticism in elementary school children of 7 to 10 years of age based on gender differentiation and concluded that no significant relationship between curiosity and intelligence on an overall basis except for girls of 10 year of age. The relationship between curiosity and creativity was significant only for certain age groups, however, no development trend was observed. The relationship between curiosity and extraversion was significant for certain age groups and for certain subjects of curiosity. There was no overall significant relationship between curiosity and extraversion.

**Sharma, K. (1982)** attempted a study to explore the relationship of creativity with certain background, psychological and organizational factors of a student of higher secondary school of Delhi. The major findings were boys were more creative as compared to girls which also indicated that scholastic achievement was found to be positively related to the measures of creativity. Creativity was significantly higher in the high I.Q. group in comparison to middle and low I.Q. groups, further, the middle I.Q. was found to be significantly higher than the low I.Q. group.

**Singh (1982)** studied the creative thinking of high school students with some cognitive and non-cognitive variables. The major findings of the study were the verbal and non-verbal creative thinking scores of high scholastic students were normally distributed. The high school boys achieved significantly higher scores than the high school girls on the measures of verbal and non-verbal creative thinking. The verbal, non-verbal and total creative thinking scores were positively and significantly related with the verbal and non-verbal intelligence of high school students.

**Srivastava (1982)** conducted a study to find out the relationship of creativity with personality factors, along with other effecting factors among high school students. The main findings of the study were that there was positive relationship between the scores on creativity and the scores on different personality factors. Boys were found more creative than girls. There were no significant differences among the
Hindu and the Muslim students in regard to creativity and the socio-economic status of the family was having a positive relationship with creativity of their childrens.

Shanmugasundaram (1983) further substantiated the earlier findings on study habits of high achievers and low achievers with other variables which affects academic achievement of students. His study revealed that high achievers students had better study habits, high IQ and higher achievement motivation than low achievers, while low achievers had higher manifest anxiety and more adjustment problem. It also showed that urban students were more intelligent having better study habits and higher achievement motivation and performed better academically than those from semi-urban and rural areas. Further, the female students showed higher achievement motivation, intelligence, good study habits and better academic performance than male students.

Sween (1984) in the researchobjected to investigate the effect ofintelligence on performance of studentsalong with other psychological variables on performance of pupils in various combinations, viz. double, triple and quadruple. Major findings of the study indicated that high intelligent students scored significantly better than low intelligent students. Students with high self-concept achieved significantly higher scores than those with low self-concept students.

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

Misra(1982) investigation on overall scientific creativity found that girls excelled boys in overall scientific creativity and influence flexibility and originality. Girls with high scientific creativity perceived more stimulation in their homes than girls with low scientific creativity. Boys with high scientific creativity perceived less social isolation in their home environment. For girls significant positive relationship existed between increasing levels of nurturance and overall scientific creativity and girls perceive higher scores on overall scientific creativity and originality aspect of
scientific creativity than their male counterparts.

Shukla and Sharma (1987) administered a Scientific Creativity Scale in 330 urban, rural and refugee students in the middle school to test for fluency, flexibility and originality. The results indicated that the lowest scores came from tribal pupils and rural pupils scored higher in fluency than the refugees.

Raina (1986) in the study tried to explore the achievement in science with scientific creativity and concluded that intelligence was significantly related to Scientific Creativity. The problem solving ability was significantly related to the three components of creativity (fluency, flexibility and originality). Gender as a main variable did not show significant variations in the Scientific Creativity of students.

Kapoor (1987) in her study objected to find out the prime factors like intelligence, study habits, SES, students adjustment related to high and low academic at the junior high school level male and female students and concluded among both the boys and girls, the high achievers tended to show a higher level of intelligence as compared to the average and low achievers. Among boys and girls, the high achievers have the better study habits as compared to the average and the low achievers. The high achievers tended to plan their studies properly had proper reading habits could concentrate on their studies and can prepare for the examination in a better and planned manner.

Gupta, K.K. (1988) conducted a study on the creative development of secondary school children in relation to sex, intelligence and urban and rural background on the prime quantum of creative development of secondary school boys and girls along the age continuum and differences on gender and creative development. The major findings were urban and rural boys and girls developed rapidly in creativity from the age of 11 to the age of 13 and 14 but later there was a sharp decline up to the age of 15 years. In general creativity had a tendency to rise from the age of 11 and continue to do so up to Grades VIII and IX. After this stage a sharp decline was observed. The development of creativity was at its peak in between the age of 13-14 years.

Khiangte (1988) conducted a study to examine the creative thinking ability in secondary school students by comparing personality characteristics of the high
creative and the low creative secondary school students and to make suggestions for improving the educational practices to enhance creative thinking ability among secondary school students. The major findings of the study were high creative students were superior in personality traits of abstract thinking, assertive, affected by feelings, tender minded, placid, doubting, venturesome and reserved when compared to low creative, high creative girls were observed to have a higher degree of ergic tension than the high creative boys, and were noted to be tense, restless and took a poor view of the degree of unit, orderliness and leadership, rural high creative students when compared to urban high creative girls showed that high creative girls from urban areas were found to be more intelligent, emotionally stable, conscientious, tender minded, and self-sufficient as against their reserved, group-dependent and expedient rural counterparts.

**Sharma (1988)** conducted a study to find creativity in terms of its components, and aimsto determine the self-concept, values, need, and personality factors of adolescents in relation to fluency, flexibility and originality. The major findings of the study were, on the basis of empirical verification of the null hypotheses of the study, it was found that when the adolescents were imbued with high or less creativity components (fluency, flexibility and originality) they had clear perceptions about their values, self-concept, needs and personality factors. Each component of creativity had its own orientation and should be studied separately to enhance our knowledge of the truth.

**Sumangala V. (1988)** conducted a study for the identification of some psychological and other social-familial variables as correlates of creativity among secondary school children concluded that that the robust creativity associated psychological and social-familial variables combining the results high-creativity loaded factors indicated by factor analysis were the psychological variables and the social-familial variables. The psychological variable ‘self-concept’ and the social-familial variable ‘ordinal position in the family’ had no association with creativity. The psychological variables, ‘examination anxiety’ and ‘general anxiety’ had no negative relation with creativity.

**Ray (1989)** conducted a comparative study of a few personality characteristics of creative minds in arts and science and their parental relationship during childhood.
classified on gender basis. The major findings of the study were parental love experienced by the scientific-creative group was positively less than in the case of the manifestly non-creative group. There was a statistically significant difference between the male scientist group and the male non-creative group. This was true in the case of both male and female subjects. There was a significant difference between the normal and the two creative groups which was discussed in detail on different criterias.

Singh, C. (1989) conducted a study on measuring the interactive effect of creativity and second order personality factors on learning among adolescent students. The major findings were need achievement was a significant determinant of the anagram task learning of female adolescents. The success of female adolescents on anagram task learning was significantly influenced by their creativity components. Female adolescents having low level of PFQ and PFQII had higher score on anagram task learning. Female adolescents having high level of PF Q-III, PF Q-IV PF Q-V and PF Q-VI had higher score on anagram task learning. The interactive effects of each creativity components and personality factors on anagram task learning performance showed a lot of combinations and variations.

Chadha and Chandna (1990) in their study focused on correlation between creativity, intelligence and scholastic achievement of students. The findings of the study were correlation was positive and significant between creativity and intelligence, creativity and scholastic achievement and intelligence and scholastic achievement, intelligence quotient correlated with creativity and scholastic achievement. There was positive and significant correlation between intelligence and scholastic achievement when the effect of creativity was partialled out. There was negative and significant correlation between creativity and scholastic achievement when the effect of intelligence was partialled out.

Dev and Pal (1990) conducted a study to determine the relationship between the selected study habits and academic achievement of students and major findings of the study were that a significant relationship was found in between study habits and academic achievement. College environment was also found to be related with study habitsof student majorly.

Roy, D.K. (1990) conducted a study to evaluate the personality difference
between the low and high scientifically creative adolescents on various dimensions of creativity based on the S.I. model of Guilford. The major findings of the study were that lower scientific creativity (LCS) and higher scientific creativity (HSC) groups differed significantly on all the three parameters of structure of intellect model. The HSC group was found to be better than LSC group on these parameters. HSC adolescents differed markedly from the LCS adolescents in terms of most of the personality traits.

**Badhri (1991)** in a research focused to find inter-correlation and difference in between intelligence, study habits etc, if any, in the reasons for boys and girls. Study concluded that the causes of poor achievement were identified as poor study-habits, low motivation, policy of liberal promotion to the next higher class, lack of parental involvement in education and poor teaching.

**Koteshwara (1991)** conducted a comparative study in between boys and girls of the characteristics of high achievers and low achievers in reading of class VIII pupils were special reference to study habit, school, home factors etc. Research primarily concluded that low scoring boys and girls did not differ in these reading abilities, girls had better study habits than boys, urban students had better study habits than rural students and high scorers on reading achievement had better study habits than low scorers students.

**Padhi, J.S. (1991)** conducted a study to estimate relationship among the measures of creativity (CR), with various variables like classroom environment (CE) academic self-concept (ASC) and academic achievement (AA) on various bases concluded that there exists insignificant correlation between DE and AA, CR and AA was significant, ASC and AA in different school subjects was significant, CR and CE was non-significant. The main effects of CR and CE and AA were significant. The main effects of CR and CE on ASC were significant. The interaction effects of CR x CE on AA was found to be non-significant.

**Rajyaguru (1991)** in his study inquired about the intelligence, study habits, personality and other psychological correlates of maths students. Majorly concluded that there was a better study habits in overachievers in maths, positive and significant correlation between intelligence test and achievement in mathematics was noticed, achievement in maths and numerical aptitude, intelligence and numerical aptitude,
overachievers and underachievers did not differ in intelligence.

**Arora, R. K. (1992)** conducted a study which deals with the relationship between creativity and intelligence and their interactional effects of various variables like intelligence, personality, creativity, emotional stability, personality adjustment, academic achievement etc. The main objective of study is to investigate into the interactional effect of creativity and intelligence on emotional stability personality adjustment and academic achievement. The major findings of the study were that the high creative/high intelligence group was significantly highest in emotional stability than the remaining three creative/intelligence groups, students possessing both high convergent and divergent abilities were by far the most accommodative persons among different creative-intelligence groups and all the high intelligence groups performed better than the low ones.

**Pal, Y. (1992)** conducted a study to investigate the inter-domain relationship between intelligence and personality and between creativity and personality by canonical analysis of male and female students. The major findings were that the subjects covered by the studies on the relationship between intelligence and personality had been mostly cross-sections of young and old children adolescents normal adults, males. Results indicate that there were seven meaningful squared canonical correlations. There was an inter-domain dimension, namely, general intelligence and a small group factor which had some loading on personality traits, sense of wellbeing and community. Personality factors played vital roles in promoting convergent thinking abilities. There was no evidence regarding the role of intellectual abilities in interplay of personality traits.

**Sen, Barat Kalpana (1992)** conducted a study to explore the extent of relationship of study habit pattern, intelligence and several personality factors with the scholastic achievement at the secondary stage of education. Some major findings of the study indicated overall significant difference between the two achievement groups in study habit. The two achievement groups differed significantly on intelligence. Study habit-achievement, and intelligence-achievement were positively correlated.

**Roy (1993)** examined scientific creativity among adolescents studying science at +2 level in three types schools, government, government aided and public schools.
A typical HSC (High Scientific creative) adolescent differed markedly from a typical LSC (Low Scientific Creative) adolescent in terms of most personality traits.

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

Sansanwal and Deepika (1997) in their study inferred that male and female students did not differ significantly in scientific creativity and interaction between standard and variable of gender did not have any significant influence on scientific creativity and scientific creativity scores of students belonging to high and low levels of intelligence did not differ significantly.

Sudhir and Khiangte (1997) investigated the relationship between creativity and personality characteristics of secondary school students which study revealed that the students with high creativity were superior in abstract thinking and were found to be assertive, affected by feelings, tender minded, placid and spontaneous. Urban girls with high creativity were observed to be more intelligent, emotionally stable, conscientious and apprehensive than rural girl students having high creativity. On the other hand, the rural ‘high’ creative boys were found to be outgoing, conscientious, tender minded and independent as against their reserved group, dependent and expedient urban counterparts.

Sreejaya (1998) conducted a study on scientific creativity in relation to intelligence of degree students with major objectives were to estimate the degree of association between Scientific Creativity and Intelligence, to estimate the degree of association between each of the components of scientific creativity and the four components of intelligence and to compare the three intelligence pairs (H-A, A-L, H-I). The coefficient of correlation between Scientific Creativity and Intelligence was found to be 0.7035 (total), 0.2987 (boys), 0.2832 (girls), 0.5984 (rural), 0.6219 (urban), 0.6668 (physics optional group), 0.3630 (chemistry optional group), 0.3901 (zoology optional group) and 0.4330 (botany optional group). For all samples, the
coefficients were found to be significant at 0.01 level.

**Mishra (1997)** conducted a study to assess relationship between academic achievement and intelligence, personality factor and other psychological variables for predicting the academic achievement of high school boys and girls, separately, on the basis of their intelligence, personality factors and SES. Findings of the study indicated that Intelligence was significantly correlated with academic achievement, for both boys and girls combinly, the correlation between Intelligence and Academic Achievement is higher in case of girls than that of boys, the personality factors (except self-sufficiency) are not significantly related with the academic achievement of both boys and girls and The personality factor self-sufficiency is significantly related to achievement in case of boys only.

**Rajagopalan (1998)** attempted to study creative talent in relation to convergent and divergent thinking. Major findings were that creative talent was significantly related to both convergent and divergent thinking, aesthetic creativity and scientific creative talent were significantly relates to convergent and divergent thinking whereas cognitive creative talent and talent in craft were not significantly related to either of them, divergent thinking had greater weightage for aesthetic and scientific creativity in comparison to convergent thinking. In a group of pupils whose IQ was more than 120, a highly significant relationship was found among the convergent and divergent thinking and achievement scores. A significant association between higher level intelligence (IQ more than 120) and creative talent was also seen.

**Paul (2000)** in his research attempted to investigate improper study habits of students as one of the probable causes of low achievement and also to investigate their vocational interest as one of the probable causes of their achievement level differentiated on gender and also to try out certain remedial measures to improve their achievement. Major findings of the study indicates that low or improper intelligence, study habits, physical health, general interest and others are the causes of the low achievement at individual level, members in the family, structure of the family, position of the child, socio-economic status, parent-child interaction and others contribute to the causes of low achievement at family level.
Haneeshia (2001) conducted a comparative study of scientific creativity of pupils in DPEP and non-DPEP schools in the State of Kerala. The study found that the two groups differ significantly with respect to fluency (CR = 4.27), flexibility (CR = 2.02), originality (CR = 2.07) and total creativity (CR = 4.56).

Aisha et-al (2002) conducted a study to estimate relationship between study habits and educational achievements of students. Major objective of the study was to determine the effect of the study habits on the achievement of students. Tool used in the study was an interview schedule to evaluate study habits of students and major finding was that there exists a significant and positive relationship between achievement of the students and the said factors like schedule of study habit of students.

Khan (2002) conducted a factorial study to estimate prognostic value of various Cognitive variables, i.e. verbal and non-verbal intelligence and creativity, non-cognitive variables, i.e. personality variables and socioeconomic status for girl students in determining some factors affecting the academic success in science courses. Major findings of the study were that the total sample of girls (N=200) studying in science stream of higher secondary classes had yielded seven factors namely confident and suspicious, conservative, obstructive, poor achievement, lack of non-verbal intelligence, liveliness and creativity, the factor analysis of the scores obtained by the girls securing first division (N=77) had yielded the following six factors namely nervousness, experimenting, venturesomeness, introversion, cooperative and seriousness, high achieving girls i.e. those securing first division were persevering, venturesome and harsh, but the low achieving girls i.e. those passed only were fickle minded, shy, stable, kind and conservative, high achieving girls were nervous, impulsive and lack in divergent thinking (creativity).

Fatima, N. (2003), in her study objected to study the influence of school environment, reading habit and self-concept on scholastic achievement of school children and inferred that different predictor variables were instrumental for significantly influencing criterion variable i.e. scholastic achievement for varied sub-sample groups however, in all only seven predictor variables viz. voluntary concentration-a facet of reading habit, fixing priorities-a facet of reading habit, reading fast loudly-a facet of reading habit, reading slowly and silently-a facet of reading habit.
habit, students' attitude towards school—a facet of school environment, total school environment and self-concept emerged as significant predictors of scholastic achievement.

**Nandita and Taniya (2004)** conducted a study to estimate study habits and attitude of senior secondary students towards studies in relation to academic achievement. Major findings of the study were there was positive and highly significant relationship between study attitude and academic achievement, there exists a positive and significant relationship between attitude and academic achievement and there was a positive and significant relationship between study habits and attitude towards studies of senior secondary students.

**Sirohi (2004)** conducted a study the relationship between study habits and under-achievement attitude on different factors, concluded that all underachievers indicated deficiency in study habits, 98.7% of the underachievers tend to possess unfavourable attitude towards teachers and needed guidance, 97.5% had poor concentration, 92.5% of them indicated deficiency in school and home environment, 96.2% lacked proper attitude towards examination, 72.8% faced mental conflicts, 72.8% were low in self-confidence, 72.3% had problems related to home assignments and 24.6% indicated deficiency in attitude towards education.

**Panda (2005)** studied correlation between intelligence and academic achievement of class IX students studying in government, aided and private schools and found that there was low relationship between intelligence and academic achievement in different categories of school and also there was a significant difference in academic achievement of students studying in different categories of school.

**Panigrahi (2005)** studied academic achievement in relation to intelligence and socioeconomic status of high school students and found that there was a significant and positive correlation between academic achievement and intelligence; high intelligence leads to better academic success; low positive correlation between academic achievement and socio-economic status and no significant difference between boys and girls with respect to their academic achievement.

**Oyesoji (2005)** studied correlates of learning styles on academic performance.
of secondary schools adolescents and found that there existed a significant relationship between learning styles and academic performance of secondary school adolescents; three senses of learning viz. auditory, visual and kinaesthetic significantly contributed to academic performance of students.

Wani, Gulshan (2005) conducted a study to measure personality characteristics related to vocational preferences, study habits and academic achievement of regionally classified adolescents girls. The comparison of personality characteristics, vocational preferences, study habits and academic achievement of these girls indicated that Kashmiri girls are in general more intelligent, phlegmatic, expedient, controlled and tense. Kashmiri adolescents’ school-going girls are more intelligent, sensitive, self-sufficient and tense. Dogri adolescent girls are warm-hearted, intelligent, mature and self-sufficient. On other hand Ladakhi girls are obedient, conscientious and controlled. Ladakhi girls are very low in their study habits as compared to Kashmiri and Dogri adolescent girls.

Pazhanivel (2006) in the research studied the effect of Study Habits of secondary level students partially using the modular approach on achievement of students. Major findings of the research was that the control group and experimental group students differ in their achievement in Tamil grammar and study habits of secondary level students, there was significantly related in between the achievement and study habits of students and the Modular Approach which was effective in enhancing the academic achievement and Study Habits of students.

Aruna and Usha (2006) in their study objected to find out the effect of cognitive style, intelligence and classroom climate on process outcomes in science concluded that the cognitive style and intelligence have significant positive correlation with process outcomes in science, while the classroom climate has no significant effect on process outcomes in science.

Rosamma (2007) conducted a study on the relationship between Scientific Creativity, Intelligence, Achievement Motivation, Home environment and Achievement in Science of Higher Secondary School pupils of Kerala. The study found out that the variables Intelligence, Scientific Creativity and Home Environment clearly discriminated the High, Average and Low Achievement groups. So these
variables have significant association with achievement in Science.

**Baer et al. (2008)** conducted a study to investigate personality characteristics conducive to team creativity (e.g. high extraversion, high openness to experience, low conscientiousness, high neuroticism, low agreeableness) would show synergistic increases in creativity. The finding indicated that when team creative confidence at \( T_1 \) was high, team creativity at \( T_2 \) increased quadratically as the number of team members who scored high on extraversion, high on openness, or low on conscientiousness increased. However, the number of individuals composing a team who scored high on neuroticism or low on agreeableness had no relation to team creativity under conditions of high or low team creative confidence.

**Bunyan and Choudhury (2008)** conducted a study to determine the effects of intelligence and socio-economic status on the performance of students in class-X board examination under Board of Secondary Education (SEBA) of Assam. The sample consists of 600 students who appeared and passed the class-X board examination in 2005 were selected. In addition to simple statistical methods, the bivariate product moment correlation and multiple regression analysis are applied for analysis of data. The results revealed that intelligence and SES have significant effects on the performance of students in examination and can be effectively applied to predict the future ability to perform in the examination.

**Chauhdary (2008)** studied to find out the correlation between creativity and academic achievement of the creative and non-creative students. The results shows that the value of the correlation coefficient for the two variables as creativity and academic achievement among creative students was found to be 0.234 and among non-creative students 0.14 respectively. A significant correlation was found between these two variables of creative students. It reveals that creative students who scored higher of creativity measures, would also score higher on academic achievement and vice versa. On the other hand no significant correlation was found between those two variables among the non-creative students. It is concluded that the relationship between creativity and academic achievement is positive and significant in case of higher achievers or creative students but negligible in case of non-creative.

**Dey (2008)** conducted a comparative study of the study habits of high
achieving CBSE and ICSE students in the secondary school examination on various classifications and finally concluded that to be as high achieving in CBSE and ICSE boards both, students were having very positive and constructive study habits, high achieving CBSE girls were studying more than the boys, high achieving ICSE boys were devoting more time to studies in comparison to girls and more than 90% of the CBSE and ICSE students were liking to study alone or self study.

**Narain (2008)** in her study entitled ‘Creativity and intelligence’ tried to explored relationship in between variables like creativity and intelligence and finded the conclusion that the one factor which is related to creativity but is not identical is ‘intelligence’. The term intelligence refers to individual’s ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning to overcome obstacles, by careful thought. In her empirical study she also finded that there is no firm evidence that creative individuals are either more or less intelligent than other people, definitely there exists a correlation between the two, which has a positive low correlation. Intelligence is necessary but not sufficient to produce creativity.

**Reddy (2008),** conducted a research to assess the impact of study habits on achievement in reading any subject, which revealed that study habits had an influence on achievement in reading that subject for high school students and that it may be possible to predict achievement in reading by analyzing study habits in that subject.

**Singh (2008)** in his research explored the relationship between learning style preferences and academic achievement of high school pupils. The samples of the study were 538 pupils studying in class X in the schools/colleges situated in the urban and rural locality of Dehradun district of Uttarakhand state. The data was collected by using learning style Inventory and the record of Annual Examination. Chi-values were calculated to find out the relationship between learning style preferences. The conclusion of the study was that variables like flexibility, rural, short-attention span, non-motivation centred, learning-styles preferences have been observed to be positively affecting the academic achievement of school children.

**Dhall et-al. (2009)** studied intelligence related to various variables like self confidence and academic achievement of school students with the objective to explore the relationship between intelligence and academic achievement among secondary
school students by taking a sample of 1000 students and found that there was a significant relationship between intelligence and academic achievement of secondary school students, there existed a significant difference between boys and girls of secondary school in terms of intelligence and there also existed significant difference between boys and girls of secondary school in terms of academic achievement.

**Nuthana and Yenagi (2009)** studied the influence of study habits, self-concept on academic achievement of boys and girls, with the objectives to find out the gender differences if any, on the factors affecting academic achievement and revealed that boys and girls had almost similar study habits; it also founded that boys and girls did not differ significantly on self-concept, the association of study habits of girls with academic achievement was found to be significant, while as the association of the study habits of boys was not found significant with academic achievements, it was also indicated that significant relationship between reading and note-taking habit, habits of concentration and preparation for examination had significant correlation with academic achievement of students.

**Khan (2009)** in her research tried to find out the relationship in between prime factor of intelligence and creativity using the prognostic value of the variables used in the study. The objective of the study were to study the prognostic value of components of intelligence and creativity and to investigate the gender differences in variables which potentially predict the performance of students in professional courses. Major findings of the study were that Creativity is very important aspect of the intellect. A significant relationship was found between creativity (originality, flexibility and fluency) with academic achievement irrespective of professional courses studied and the students of engineering, medical, teacher education, law and library science possessed a higher level of non-verbal intelligence.

**Sanroshi and Roy (2009)** conducted a study on, ‘*Relationship of Five Personality Dimensions with Learning Patterns among University Students*’. The study examined the relationship between the measure of big five personality dimensions with the learning behaviour pattern (cooperative, competitive and individualistic). The findings have many implications for teachers and researchers personality aspects in the field of teaching learning personnel psychology training and development and performance appraisal.
Sharma and Verma (2009) in their study investigated the effect of intelligence and personality on learning styles of student teachers. The study consisted of 514 students teachers of B.Ed. level studying in six institutions of Himachal Pardesh. The results of ANOVA revealed that the intelligence was not found significant for learning modes and extraversion dimension of personality was found to have strong connection with reflective observation mode and active experimentation modes of learning.

Kaur (2010) conducted a study of learning outcomes of adolescents in relation to their emotional intelligence, personality traits and metacognitive traits. The findings of the study were that there was positive and significant relationship between academic achievement and metacognitive variables. The results lead to the inference that adolescents with high metacognition were good in academic achievement but adolescents with low metacognition were not so good in their academic achievement. Significant difference in the academic achievement of male-female adolescentson various aspects.

Mehta (2010) studied personality needs and academic achievement of secondary school students with the objective to find out the relationship between personality needs and academic achievement by taking a sample of 120 students (50 high achievers, 70 low achievers) from five schools by using systematic sampling technique and found that need achievement, need dominance, need nurturance and need endurance were positively and significantly related to students academic achievement while need occurrence, affiliation, abasement and aggression were significantly but negatively related to academic achievement.

Rani and Porgio (2010) conducted a to find out the level of multiple intelligence of the higher secondary students and its relation with different aspects of high school students which works as its background variable to achieve in school. The study concluded that there was significant difference between plus one and plus two students in their logical mathematical Intelligence. There was significant difference between co-education and girl’s school students in their interpersonal intelligence than boy’s school students. Co-education students showed more interpersonal intelligence than girl’s school students.
Kumar and Dixit (2011) conducted a investigation to study relationship between study habits and personality related to achievement in English and Hindi medium students. Major finding of the study revealed that the overachievers are those, whose achievements are higher than the level of their abilities, these overachievers of English and Hindi medium have better study habits and they are propertied by positive personality traits, under achievers have faulty study habits also they lack enthusiasm and are emotionally instable, the over achiever English and Hindi medium students differ from under achiever English and Hindi medium students, male and female over achievers exhibit better study habits as compared to under achievers.

Premalatha and Porgio (2011) conducted a study to investigate relationship between selected personality traits and achievement in mathematics of higher secondary students. The aim of the study was to find out the relationship between selected personality traits and achievement in mathematics of higher secondary students. The sample consisted of 1200 students of whom 672 were boys and 528 were girls. The Personality inventory was designed by Manju Rani Agarwal and achievement in Mathematics was prepared and validated by the investigators. It was found that there was significant relationship between personality traits and level of achievement in mathematics of higher secondary students.

Resmi (2011) conducted a study on the self-concept, Achievement motivation and Scientific Creativity of Secondary school students. The study revealed that there is no significant relationship between self concept and scientific creativity of secondary school students with regard to gender, locality of institution and SES.

Bashir and Mattoo (2012) undertaken a study to investigate relationship in between the study habits and academic performance of male and female students on different criteria which revealed that intercorrelation of various components of study habits with students achievement, the overall correlation between the variables in which highly significant relationship was found between task orientation and concentration and between concentration and drilling. Significant relationship was found between concentration and comprehension. In female respondents, highly significant relation was found between the school environment and marks obtained, while as in case of males, no relation was found between the two.
Premavathi (2012) conducted a study on relationship between interpersonal intelligence and academic achievement of higher secondary school students. The main objectives of the study were to find out the difference between students on different dimensions of classification. The findings of the study revealed that there was significant difference between male and female students with interpersonal intelligence in total, there was no significant difference between below 16 and above 16 higher secondary school students in their interpersonal intelligence, there was significant difference between Tamil and English medium higher secondary school students with respect to interpersonal intelligence in total and there was no significant relationship between their interpersonal intelligence and academic achievement of higher secondary school students.

Rajakumar and Soundararajan (2012) conducted a study ‘A study on higher secondary students' Study Habits in Tirunelveli District’. The aim of this study is to find out the study habit of higher secondary students in Tirunelveli District. 1060 Higher secondary students were taken as sample. The tool used to find out the study habit is Study Habit Inventory by Patel (1975). Results of the study revealed that there is no significant difference between male and female, rural and urban higher secondary students with respect to their Study habit. There is significant difference between day scholar and hostel staying, government and aided higher secondary school students with respect to their study habit.

Vaida (2012) attempt was made to assess the creative levels of students studying in private and government schools so as to compare the creative levels between boys and girls and to study the influence of school environment on the creativity of students in district Shopian of Kashmir Valley. A sample of 60 students (30 boys and 30 girls) was randomly drawn from various schools of Shopian. Data was collected by using Passi’s Test of Creativity. t-test was used to find out the significant differences on scores achieved by the respondents of different schools. The results revealed that the majority of the students were moderately creative. Gender was found to have a negative relation with creativity. While as, creativity scores differed significantly among private and government school students.

Ahila et-al(2013) conducted a study to explore multiple intelligence of orphan students in Tirunelveli district. The objectives of the study were to find out the level of multiple intelligence of orphan students on different criteria. The findings of the study
revealed that there was no significant difference between male and female of orphan students in multiple intelligence and its dimension of verbal linguistic intelligence, logical intelligence, mathematical intelligence, visual spatial intelligence, bodily kinaesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence, and naturalistic intelligence. There was no significant difference among parental, maternal and complete orphan students in their multiple intelligence.

Choudhary (2013) assessed study habits and attitude of general and schedule caste students in relation to their academic achievement. Study revealed that no significant difference was found in study habits and attitude and academic achievement between general category and schedule caste students. No significant difference was observed in study habits and attitude and academic achievement between general category and schedule caste male and female students.

Kalvani and Babu (2013) conducted a study on higher secondary students’ achievement in chemistry relation to their study habits. This study investigates the higher secondary school students’ achievement in chemistry in relation to their study habits at various schools in Cuddalore district. Independent samples t-test for differences were performed across three distinct groups of gender, locality and type of school. The results of the test conducted indicate that there was positive and significant correlation found between students’ study habits and their achievement in Chemistry. There was no significant difference in the study habits of higher Secondary students in respect of gender and type of school.

Dhir, Teena (2015) in her study aimed to investigate the relationship of Cognitive style, Achievement in science, Gender and their interaction on scientific creativity of secondary school students. Survey method of research was used. The sample comprised of 158 students of Classes IX and X studying in schools affiliated to Central Board of Secondary Education in SBS Nagar district of Punjab. Standardized tools used to access the variables were Majumdar Scientific Creativity Test and Group Embedded Figures Test by Witkin, Oltman, Ruskin and Karp. Marks of students from school records were taken as a measure of their Achievement in science. The data was analyzed using ANOVA. Scientific creativity was found to be significantly influenced by Achievement in science and Gender. Scientific Creativity was found to be independent of Cognitive style. Scientific Creativity of secondary
school students was found to be independent of interaction between Cognitive Style and Achievement in Science and between Cognitive style and Gender of the students.

**Suresha and Prahallada (2015)** conducted a study to investigate the relationship of creativity and intelligence on secondary school student's academic achievement. Survey method of investigation was used to collect data from the sample of 202 Secondary school students was selected from 3 different secondary schools of Chamarajnagar city through simple random sampling technique. The Baquer Mehdi and J.C Raven-Standard progressive matrices tool was used to collect the data. In this study investigators inferred the positive relationship between creativity and intelligence on academic achievement of secondary school students.

**Yadav, Reena (2015)** conducted a study to investigate the relation of intelligence and self-concept with different dimensions of creative thinking of 10+2 students in Rewari district of Haryana and concluded that the intelligence and Self-concept of the students affects creative thinking of the students in a positive way. The intelligence of the students also affects the originality in a positive way along with flexibility and fluency factors of creative thinking. Highly intelligent students show more originality, more flexibility and more fluency on creative thinking as compared to low intelligence students.

### 2.3 Research Indications by Previous Research Review

In the psychological field consisting creativity and intelligence, number of researches were conducted to estimate intercorrelation in between creativity and intelligence and less researches has been conducted on scientific creativity. Most of them focused to validate the proposition that creativity is independent of intelligence. This point of view hardly comes to any conclusion regarding the correlational consistency in between creativity and intelligence. Factor of Creativity have been evolved through many factorial analytical studies but all these factors seems to be contaminated with variance derived from tests of intelligence or statistics used to interpret data, oblique and pro-max rotational technique was used by some investigators to obtain creativity as a pure factor in relation with different variables but resulted evidence also indicated that such factors of creativity is also found to be not correlated with intelligence factor considerably.
In the present study researcher has tried to conduct a detailed and tedious review of the researches done in the area of some basic variables which are assume to be significantly affected with academic achievement of students at the critical time of their life i.e. in their adolescence. An attempt was made to collect the thorough evidence of found literature in the concerning matter taking creativity in special context to scientific field in which it is implicated. After the detailed study of the available literature it was found that creativity is often taken to be as independent variable, free from the effect of other psychological variables or it is treated as a basic factor having the component of fluency, flexibility and originality only as taken in some basic fundamental studies concerning area. Along with many assumption check and conclusion reached after the review of studies mentioned so far, a perspective is found of the empirical works done in the area. The major implications derived from the review of related studies can be presented as below:

1) Most of the studies conducted concerning the achievement of general students the studies concerning the achievement of science students are still very few.

2) Numerous researches have been conducted in relation to cognitive variables of students. Review of related literature indicates that no study is conducted having the undertaken primary variables and discriminating them on the detailed aspects of cognitive, affective and descriptive aspects of variables as taken in the study.

3) Studies on describing and discriminatingadolescent students considering gender differentiation in science students in relation to scientific creativity are very rare.

4) A majority of the reported studies on scientific creativity have been done considering the variable of creativity in general or to restricted areas of fluency, flexibility and originality only. Detailed classification as taken in study including science students’ scientific creativity has not correlated as such in previous studies.

5) Majority of studies conducted on variables like scientific creativity, intelligence, personality and study habitsconsideredthem to be a whole component, no or less differentiation in between these variables are found in studies conducted so far. Present study comprises detailed
classification of variables taken than the studies done so far.

6) The review of above-mentioned studies does not attempt to evaluate predictory role or relation of undertaken variables in the study. Present study is an attempt to find the predictory role of essential variable involved in creative potential of adolescent students.

Review of related literature provides essential evidential supports regarding validation, novelty or usefulness of study to be conducted. Simultaneously, it also provides essential points which should be taken as precautionary measures to conduct study flawlessly. Review of related literature of the undertaken study has revealed numerous points and techniques which can be used to conduct the study related to the impact evaluation of various psychological variables taken in the study which effects creative potential of XI grade adolescent male and female students separately which also plays its significant role in their academic achievement also. The long and tedious review of literature also encouraged researcher to design and to conduct a detailed classified intercorrelational discriminating research, which not only helps in to identify, assess but also predict the extent to which dependent variable is affected by the other fundamental variables taken in the study.