CHAPTER -II
REVIEW OF RELATED STUDIES

2.1 INTRODUCTION

Our chief highlights the review of related studies. This has six sections. The seventh section is the overview of the entire chapter. The second section outlines the clarity and the need for the study. The third section gives the Indian studies and the foreign studies related to Learning Styles. The fourth chapter section focuses on the Indian studies and the foreign studies related to School climate. The fifth section focuses on the Indian studies and foreign studies related to Academic achievement. The sixth section gives the synthesis of the reviews. The seventh section is about the research gap which has been identified by the researcher after reviewing the related studies and directed the researcher to precede the study in the right path.

2.2 THE WHY OF THE RELATED STUDIES

A survey of related literature not only forms one of the early chapters of thesis, but also serves other useful purposes.

“Practically all human knowledge on be found in books and libraries. Unlike other animals that must start a new with each generation, man builds upon the accumulated and researched knowledge of the past”- John W.Best (1988).

“The keys to the vast store house of published literature may open doors to sources of significant problem background for selection of the procedure and comparative data for interpretation of results”- J.C.Aggarwal 1966, (p.88).

The aim of this chapter is to record briefly the findings of research studies conducted on topics that are related to the problem under study. Thus for any investigator, the study of literature related to his/her investigation is essential and it serves the following purposes.
i) To show whether the evidence already available solves the problem adequately without further investigation and thus avoids the risk of duplication.

ii) To provide ideas, theories, explanations of hypotheses valuable in formulating the problem.

iii) To suggest methods of research appropriate to the problem.

iv) To locate comparative data useful in the interpretation of result.

v) To contribute to the general scholarship of the investigator. The review of related literature enables the researcher to define the units in the field. It helps the researcher to delimit and define his/her problem. It allows the researcher to acquaint himself/herself with current knowledge in the field in which, he/she is going to conduct the research. Therefore, the investigator went through the surveys of educational research, educational journals and other education related research literature and prepared an abstract of review and the same is presented in the succeeding paragraphs.

Research begins with ideas and concepts that are related to one another through hypotheses that is expected or anticipated relationship. These expectations are then tested by transforming or operational vitality the ideas and concepts into procedures for the collection of data. Results of finding based on these data are then interpreted and extended by converting them into new concepts, but where the original ideas do and concepts come from hypotheses. To some extent they come out of by the researcher’s head, but to a large extent they come from the collective body or prior work referred to as a literature. Review of related literature allows the researcher to acquaint him/herself with the current knowledge in his or her field and it will be an effective search for specialized knowledge in his or her field and it will be an effective search for specialized knowledge possible.

So, also knowledge of related literature enables the researcher to define the frontiers of his field. “ it can also give the student a great deal of insight into the methods, measures, subjects and approaches used by prior research workers and can thus read to
significant improvement as his/her design.” According to Best (1995) “a brief experts provide research and the writings of recognized experts provide evidence that the researcher is familiar with already known and with what is still unknown and untested. Since upon past knowledge these steps help to eliminate the duplication of what has already been done and provide suggestions for meaningful investigation”.

With references to the above, the researcher attempts to survey and review related studies and furnish them in the following sections.

**Fig. 2.1 showing steps and strategies involved in the review of related studies.**
2.3 CLASSIFICATION OF RELATED LITERATURE

The review of related literature pertaining to the present study is classified into two categories:

A. Review of Indian Studies
B. Review of International Studies

2.3.1 INDIAN STUDIES ON LEARNING STYLES

Amudha.R and Muthaiyan.R (2014) investigated “Emotional Intelligence and learning styles of Teacher trainees in DIETs, to their Academic Achievement”. The objectives of the study were (i) to find out whether there is a significant correlation between Visual and Auditory learning styles of Teacher trainees. (ii) to find out whether there is a significant correlation between Visual and Kinesthetic learning styles. (iii) to find out whether there is a significant correlation between Auditory and Kinesthetic learning styles (iv) to find out whether there is a significant correlation between Auditory learning styles and Academic Achievement of the teacher trainees. (vi) to find out whether there is a significant correlation between Kinesthetic learning styles and Academic Achievement of Teacher Trainees. The study was conducted on sample of 813 Teacher trainees through random sampling technique from East and North Zone DIET of Tamil Nadu state. After selecting the sample Bar-on’s Emotional Quotient Inventory, VAK Learning styles Inventory and Achievement Test for teaching of English was constructed, validated, standardized by the Researcher and Research supervisor. They found (i) there is negligible negative correlation between Visual and Auditory learning styles of teacher trainees. (ii) there is moderate negative correlation between Visual and Kinesthetic learning styles of teacher trainees. (iii) there is negligible negative correlation between Auditory and Kinesthetic learning styles of teacher trainees. (iv) there is substantial negative correlation between Auditory learning styles and Academic Achievement of the teacher trainees. (vi) there is a negligible positive correlation between Kinesthetic learning styles and Academic Achievement of Teacher Trainees.
Sony Francis.C (2014) studied “Styles of Learning and Thinking of Graduate Students in Kerala”. In the present study survey method was adopted to accomplish the objectives. SOLAT tool developed by Dr. Venkataraman (1994) was used to measure the hemisphere preferences for information processing. The tool consisted of 100 items based upon accumulated research findings concerning the specialized functions of the left and right hemispheres. The study was collected in various professional and non-professional colleges at various districts in Kerala. The researcher found that marked difference between the Right hemisphere Learning and Thinking Styles of females and Left hemisphere learning and thinking styles of Female Graduates. There is no significant difference between the Learning and Thinking styles of Professional and Non-Professional Graduate students.

Amudha and Muthaiyan (2013) explored “CCE an enhancer of learning styles of the learners”. The objective was to confirm that the continuous and Comprehensive Evaluation (CCE) gives space the individual learning styles of a learner. They discussed the special features of CCE and how it helps in strengthening the visual, auditory, kinesthetic (VAK) learning styles and the scope of VAK styles of learning in the scholastic and co-scholastic areas of evaluation in the light of CCE. It has been substantiated that the CCE is an assessment for learning, in order to provide continuous feedback for teachers and learners to fill in the learning gap, as it incorporate the teacher’s observation of varied learning styles and encourages him/her to reflect on how to facilitate learning effectively. It was concluded that CCE definitely be the enhancer of learning styles of the learners.

Rajshree S. Vaishnav (2013) analyzed “Learning Styles and Academic Achievement of Secondary School Students” Learning styles refers to the ability of learners to perceive and process information in learning situations. One of the most important uses of learning styles is that it makes it easy for teachers to incorporate them into their teaching. There are different learning styles. Three of the most popular ones are visual, auditory, and kinesthetic in which students take in information. This study is an analysis of learning styles prevalent among secondary school students.
Objectives: The following objectives were set for the study, to know types of learning styles prevalent among secondary school students. To study the relation between Learning Styles and Academic Achievement of Secondary School Students. To compare the effect of different learning styles on academic achievement secondary school students.

The hypotheses formulated for the study are the following: There will be no significant relation between learning styles and academic achievement of students. There will be no significant effect of learning styles on academic achievement of students. The study was conducted on a sample of 200 students through random sampling technique from various schools of Nagpur city in Maharashtra state. After selecting the sample the Horward Gardner’s VAK Learning styles brain box and VAK Learning Styles Inventory by Victoria Chislett and Alan Chapman was used to identify the preferred learning styles of students. On the basis of learning styles, students were divided into three groups: Visual, Auditory, and Kinesthetic. The co-relation between academic achievement and learning styles was determined using Pearson’s product moment co-efficient of co-relation method and also to identify the effect of learning styles on academic achievement ANOVA test was used. Results show that, numbers of kinesthetic learners are more than visual and auditory. It means kinesthetic learning styles are more prevalent among students. Positive high correlation between Kinesthetic Learning Styles and academic achievement of students. Very negligible positive correlation was found between Visual Learning Styles and academic achievement of students. Whereas positive low correlation between Auditory Learning Styles and academic achievement of students. Therefore, Kinesthetic Learners are more benefited in traditional classroom at secondary level. There exists significant effect of Different Learning Styles and academic achievement of students.

Madhu Gupta and Meenu Kapoor (2012) examined “The impact of Learning Styles and Study Habits of High School Students on Their Scholastic Achievement in English”. In this study, descriptive method had been employed. Learning styles and study habits were treated as independent variables. Learning styles were varied at three levels
viz. left hemisphericity, right hemisphericity and integrated hemisphericity whereas study habits were varied at two levels i.e. good and poor. The sample comprised of 300 students of 10th class studying in various schools located in urban area and affiliated to Haryana Board of School Education. Multi-stage random sampling technique was used to select the sample for the present study. Scholastic Achievement in English of the subjects has been obtained by administering the self-developed Achievement Test in English. The Indian version of the SOLAT (Styles of Learning and Thinking) test by Dr.D.Venkatraman and the Test of Study Habits and Attitudes by Dr.C.P.Mathur has been used to identify the learning styles of the subjects and to judge the study habits respectively. Statistical techniques like Mean, SD, t-test and ANOVA were employed. Findings revealed a significant difference in scholastic achievement in English among the student with three categories of learning styles viz. left hemisphericity, right hemisphericity and integrated hemisphericity. It was also found that students with hemisphericity had more scholastic achievement in English than those who had left hemisphericity or right hemisphericity. The study further revealed that students with high scholastic achievement have better study habits as compared to the students with low scholastic achievement. Significant interaction effect of learning styles and study habits scholastic achievement English among high school students has also been reported.

Reena George and Archana. S.S (2012) analyzed “Learning styles and under achievement among students at secondary and higher secondary levels”. They analyzed an individual learning styles and approach to a learning situation has a direct impact on performance and success in achievement of learning outcomes. The study was conducted on a representative sample of 900 students selected at random from the Secondary and Higher Secondary schools of Kerala. The underachievers, normal achievers and overachievers in the Secondary and Higher Secondary Schools of Kerala were identified using Ravan’s Standard Progressive Matrics Test of Intelligence and Achievements Tests for students at the Secondary and Higher Secondary level. Learning Styles Inventory developed by the investigators, following the conventional procedures of test construction and standardization, was employed for finding out the learning styles of the sample. Descriptive study and normative survey was followed for data collection.
Regression technique, chi-square test and critical ratio test were the statistical techniques employed. The study analyses the relation between learning styles and academic achievement among students at the Secondary and Higher Secondary level. Visual learning styles were found to be the most preferred than auditory, tactile and kinesthetic learning styles. Majority of the students constituted the normal achievement. Underachievers were found to differ significantly from normal and overachievers in their learning styles.

Vasanthi (2010) studied “The problem and functioning of active learning methodology in learning English at standard VII in Thiruvarur District”. It aimed at finding the functioning and the problems when following the active learning methodology in the classroom in teaching English as a second language. Survey method was followed involving 400 students, 120 teachers, 50 HMs, 50 BRTEs. The tools were self-constructed questionnaires and opinionnaire. The findings suggested that the implementation of active learning methodology contributed more to qualify education: also it aimed at maximizing the individuals learning and making it more relevant and productive.

Baskaran (2007) researched “The implementation of joyful learning technology at multigrade primary school”. In this method to identify the attitude of teachers, survey method was adopted. Case study was attempted for viewing social reality. To find out the impact of the joyful learning technology experimental method was followed. Teachers and students were selected through stratified random sampling technique. Data were collected from the tools like attitude scale, achievement test and problem questionnaire and analyzed using percentages mean, SD, “t” test, Pearson product moment correlation and ANOVA. All the indicators show that after the implementation of joyful learning technology the general achievement level of the students has improved and the primary teachers have favorable attitudes towards joyful learning techniques.

Pandey and Kothari (2007) conducted a study on “The effect of emotional intelligence and A/B personality type on learning styles among executives”. The study
tries to investigate the influence of Emotional Intelligence and A/B personality type on learning styles among executives. Purpose of this study is to describe how an aspect of learning theory, specifically learning styles, can be applied to the development of the behavioral patterns of executives through training programs. 50 executives were selected from two organizations in manufacturing industry. Executives were taken from the production departments ranging from lower level management to upper level management. The emotional intelligence test by Daniel Golmen (1995) was used and A/B personality type inventory developed by Fisherman Roseman. Dimensions of the learning styles were measured with learning styles inventory by Honey and Mumbford (1986). The Emotional intelligence and personality type has a positive effect on the learning styles among inclined towards theoretical styles of learning and gave second preference to pragmatist learning; on the other hand individuals with average level of emotional intelligence prefer reflector and pragmatist styles of learning. The individuals having lower level of emotional intelligence showed a scattered preference in their learning styles. It was observed that the executives, most common of the three personality type is type A/B, which shows more inclination towards reflector styles of learning.

Civi (2006) identified, “The impact of activity based learning in mathematics for high and low achievers of standard IX”. The investigator followed experimental method and the sample of the study included eighty IX standard students. The tools employed were lesson transcripts on activity based learning and achievement test in mathematics. The collected data were analyzed using mean, standard deviation and ‘test’. In this study, the activity based learning approach is found to be an effective method. As an instructional procedure, it has an increased achievement of all the students and in particular, the achievement of high low achievers when compared to the traditional methods.

Chauhan (2004) made “A study of learning styles of high school students in the context of their adjustments and extroversion introversion”. This study examined to know the various learning styles preferences of high school pupils. It compared the learning styles preferences of extrovert and introvert pupils on the basis of better adjusted and
poor adjusted. The method adopted in this study was a randomly selected sample comprised 900 pupils age group of 14-15 years studying in government colleges in the district U. Harkashi (Uttartanchal), normative survey method was followed. Learning styles inventory (LSI), Adjustment Inventory (AI) and introversion extroversion Inventory (IEI) were employed for the collection of data. The collected were analyzed by using the percentage analysis. In the findings, there appears a mild positive linkage of the students “sex” be stated up to a significant level. There appears no positive and significant linkage appears between the learning styles preferences of extrovert pupils with their adjustment status, there may be a positive linkage between the introvert pupils’ adjustment status and their preference to various learning styles but may not up to the significant level. There is positive linkage of the extroversion/introversion personality type of better adjusted pupils with their various learning styles preferences, but it is not to the significant level. A positive linkage is held between the extroversion and introversion personality type of poor adjusted pupils.

Jayaraman (2003) conducted a study on “Facilitate children’s achievement in mathematics at primary level through learning activity centered styles”. It aimed to find out the effectiveness of the technology accessed low-cost learning Kit (s) for mathematics at primary level; to state the importance of the “Learning Activity Centered Styles; to assess the children’s achievement in mathematics and to evaluate the effectiveness of the drill and practice method of teaching learning in mathematics. Pre-test post test non equivalent groups experimental design was employed. Under incidental sample techniques, V standard children were selected in Panchayat Union Primary School, Kondalampatti, Salem district, Tamilnadu. Auestionnaire was administered on 100 teacheres, working as secondary grade teachers in Salem and Nammakal district primary schools. Information was collected on learning kit(s) for mathematics and analysed using percentage. The findings showed high achievement is possible in learning fractions in mathematics at upper primary level due to the application of the activity centered styles as experimental approach when compared with the conventional approach, the usage of the technology accessed low cost learning kit(s) for mathematics and by following the drill and practice approach: importance of the learning activity centered styles is found to be
more effective at the primary level teaching-learning process: usage of the technology accessed low cost learning kit(s) for mathematics is found to be useful for upper primary children to learn mathematics individually in class as well as at home; teachers welcome this new styles of approach viz., learning activity centered styles, the technology accessed low cost learning kit(s) and the drill practice method.

**Vyasa** (2002) conducted “A study of learning styles, mental ability, academic performance and other ecological correlates of under graduate adolescent girls of Rajasthan”. The study compared the academic performance of students in respect of different learning styles, to study the effect of ecological correlates on the academic performance girl students and to study the interactive effective of mental ability and learning styles on academic performance of girl students. The sample of 500 girls from class XII of 16 government Sr. secondary schools of Baran, Bundi, Jhalawar and Kota district in Rajasthan was taken. Under ecological category the research opted the area (urban / rural) and the level of parent’s education, their occupation and income. The tools are learning styles inventory by K.K. Rai and S.K. Sexena and academic performance marks obtained by the students in board examination. The statistical techniques used were Mean, S.D, ‘t’ test ‘F’ test for data analysis. In the findings the environmental, emotional, sociological dimension of learning styles does not affect significantly the academic performance of girls. Residence as urban/rural and ecological correlates has significant effect on the academic performance of girls. Parents’ education, occupation and income do not affect significantly the academic performance of girls. The environmental dimension of learning styles preference does not affect the academic performance where as mental ability influence the academic performance of students.

**Parimala** (2001) attempt
ded to evaluate “Self learning-group inspiration model in learning environmental science”. This study examines the effectiveness of group inspiration modem with that of traditional method on achievement in environmental science. The ten lessons on V std. environmental science text book were taken for developing self learning through group inspiration model with the objectives of teaching namely understanding new words, concepts, group activity, review and follow-up work.
The sample was classified into internal group, experimental group using entry behavior test. Experimental method was adopted and ‘t’ test was used to analysis the data. It is concluded that the traditional method in teaching the concepts of environmental science at primary level.

Kamel (2000) prepared “Self-learning packages for maximizing errors in written English committed by college students”. First year degree students formed the sample. Experimental investigation with single group design was made. Self learning packages were developed by the researcher. Questionnaire, diagnostic test and achievement tests were used as the tools. The collected data were analyzed through mean, standard deviation and T test. The self learning packages developed by the researcher have significantly minimized errors written English committed by students of first degree level.

Usha (2000) focused on “The Effect of Co-Operative Learning on Achievement in Chemistry, Perception towards Teaching Learning and Social Relations”. Comparing the effectiveness of cooperation learning method with conventional method in learning selected units in chemistry at the higher secondary level formed the major hypothesis of the study. Students enrolled in XII standard constituted the sample. Printed text booklet, printed programmed text and achievement tests were the tools employed in this study and ‘t’ test was the statistical measure used for data analysis. The study concluded that cooperative learning approach in general makes the children interested in learning chemistry and it is more useful to decrease waste and stagnation and the number of the academic year and it also maxims the students.

Arulmozhi (1999) conducted “A study on the effectiveness of co-operative learning approaches and motivational strategies on enhancing SC/ST girl students’ achievement on Mathematics”. The study recommended introducing cooperative learning for the upliftment of rural pupils as instruction through cooperative learning approaches and allows needed freedom in instructional strategies. In addition motivational strategies
are also help to increase students’ attention in the classroom, which in turn develop all round personality and attitude among them.

Moosa (1997) studied about “Concept mapping and academic achievement of pupils in chemistry in higher secondary schools”, Pre & post - test design was adapted. The sample consists of 10 boys, 10 girls and 30 coeducation students. Achievement test and ideal concept maps were the tools. The data was analyzed through mean and SD. The findings revealed the impact of concept maps; students in XI standard were able to learn the selected units in concept mapping. Learning through concept mapping increased the level of achievement of students in chemistry.

Raina (1989) studied “Student- Learning Styles, analysis of theory, Research and Instrumentation”. This study aimed at analyzing and reviewing the theories and issues relating to student learning styles, including environmental, emotional, sociological, physiological styles. To study the research relating to elements learning styles at different objective levels of education, its capacity to identify styles, and its possible use in Indian situations, and to suggest research areas in this field, and possible implications for improving teaching-learning practices. Various models of learning styles as identified by Dunn and Price, Jung’s psychological types and the matching of cognitive styles, learning styles in relation to psychological types, cognitive styles perspective, Gregore’s phenomenological perspective, four MAT system of learning styles, holist serialize styles, etc., were discussed Details of various instruments for cognitive styles measures Edmond’s Learning styles, Delineator Letter’s Cognitive profile, Affective Styles Measure (the Paragraph Completion Measure, Gresha - Riechmann Student Learning Styles scales,) Physiological Styles Measures (Dunn, Dunn and Price Inventory; NASSP inventory), and miscellaneous Variable (Learning Styles Inventor and Thinking Styles Inventory), have been discussed. Comparison of four learning styles instruments along with research evidence was provided. The findings of the study suggested some issues, unresolved problems, and possible applications of learning styles theory research and development.
Odud (1989) studied the “Effects and strategies of instruction on mastery learning”. The study attempts to investigate the effects of strategies of instruction on mastery learning. To study the comparative effectiveness of different strategies of instruction on the comparative effectiveness of different strategies of instruction on the criterion of immediate attainment of mastery. The sample comprised 300 learners of standard VIII of five urban boys’ high schools, distributed over three districts. Three treatment groups were formed. Transmission of heat was the subject for mastery learning. Linear programmed text, branching programmed text, workbook, and audio visual (tape-slide, film-strip, transparency, experimental kit) aids were developed. The tools used included tests of Formative Evaluation and Summative Evaluation, which were developed. There was no significant difference between different strategies of instruction on the criterion of immediate attainment of mastery. As regards the retention of mastery all the three groups varied significantly in favor of the third strategy followed by the second and the first. Hence, formative evaluation is the best suited for master learning.

Desari (1989) studied “Learning experiences and the effectiveness in teaching”. It attempts to study the learning experience and their effectiveness in teaching. To study the hierarchy and interdependence at learning experience, and their application in making the teaching-learning process effective and increasing concentration and abstractness. The higher the concreteness of learning experiences provided to students, the higher was the perception level in them. Organization of different learning experience at the right time and right place provided better understanding of the subject matter than any single experiences. Exhibition of real objects provided experiences of higher order than contrived experiences. Higher order experiences always embraced the lower order experiences. The principle of “unity of experiences” or “wholeness of experience” must be clearly understood by the teacher to make the teaching-learning process more effective by coordinating the different learning situations of the subject-matter. It was seen that no amount of demonstration or lecturing can take the place of individual experiences with reality. The concreteness and directness of the learning experiences depend upon the number of senses (visual, aural, olfactory, gustatory and tactile) used effectively in their relative effectiveness and interrelation to form sense perception which
provides basic information to give intellectual skills of cognitive value and physical skills of productive value. No acquired experience is absolute; it is a function of time and space. Classification of learning experiences can be presented in pictorial model, were each learning experience is stated as a permeable bail, one enclosed in the other. The largest one is the direct learning experience and the smallest one book-reading experience. The larger the size of a ball, the more concrete is the learning experience; the smaller the size of ball the less concrete is the learning experience. Objective experiences model experiences, and language experiences increased the concreteness and abstractedness.

Mehra (1988) studied “The effectiveness of an integrated system of instruction for concept and principle learning in different school climates at secondary level”. In the present study an attempt has been made to study the effectiveness of an integrated system of instruction for concept and principle learning in different school climates at secondary level. To develop and study the effect of an integrated system of instruction (ISI) for a segment of science at the secondary level, and to study the relative effectiveness of the two instructional designs in a democratic as well as, authoritarian school climate, for high and low intelligence levels, at the knowledge and comprehensive level objectives. The sample consisted of 166 students of class VII from two representative English medium schools of Chandigarh, in the age range 11-13 years 55% of the subjects were boys, 84 students were from a democratic, and 82 from an authoritarian schools. The tools used to collect data were integrated system of instruction. Achievement test, Jalota’s Group Test of General Mental Ability (GTGMA) and Halpin and Croft’s Organizational climate Description Questionnaire (OCDQ) rating scale mean, SD, Skewness, Kurotosis, ANOVA. Chi-square, ANCOVA, was employed to treat the collected data. The integrated system of instruction group yielded better achievement scores than the traditional instruction group. The high-intelligent attained more scores in the authoritarian than in the democratic school climate at intelligent group performed equally well in both climates at both level of objectives. The integrated and the traditional systems of instruction yielded comparable results in authoritarian and democratic school climates with high and low intelligent groups of knowledge than at comprehension level.
objectives. High and low intelligent groups achieved better knowledge than at comprehension level on concept learning: the high intelligent group attained concepts more than low intelligent group at both levels of objects. The integrated system of instruction yielded better results than traditional instruction (concept learning and principle learning) in both authoritarian and democratic school climates. Retention was exhibited more in the democratic than the authoritarian school climate. The high intelligent group exhibited better initiative than the low intelligent group. A democratic school climate helped the low intelligent group more than the high intelligent group to develop initiative.

2.3.2 INTERNATIONAL STUDIES ON LEARNING STYLES

Breckler et al. (2009) classified Student learning according to the sensory modalities by which one prefers to take in information. One such classification scheme uses the VARK instrument, which categorizes learning preferences as visual (V), auditory (A), reading-writing (R), or kinesthetic (K). They found that the majority of students interested in the health professions have multimodal learning preferences. He observed some gender differences when separating student groups by career choice. More premedical men had multimodal preferences compared with no premedical men. In contrast to men, women showed little differences in their learning styles profiles whether premedical or not and also self-predicted their learning preferences more accurately. Thus, career choice may be an important consideration in determining whether or not there are gender differences among students.

Chiou (2008) investigated whether college students' role models (technical teachers vs. lecturing teachers) and preferred learning styles (experience-driven mode vs. theory-driven mode) in collaborative teaching courses would be moderated by their cognitive development (absolute thinking vs. relativistic thinking) and examine whether academic achievement of students would be contingent upon their preferred learning styles. The results showed that those participants with absolute thinking perceived the modeling advantage of technical teachers was greater than that of lecturing teachers, preferred the experience-driven mode over the theory-driven mode, and displayed
differential academic achievement between technical courses and general courses. On the other hand, the students with relativistic thinking revealed no difference in perceived modeling advantage of role models, learning styles preferences, and academic achievement between two categories of courses. This research indicates that college students' preferred learning styles would interact with course category (technical courses vs. general courses) to display differential academic achievement.

Rayneri et al. (2006) studied inconsistent performance by gifted students has been a source of frustration for both parents and educators for decades. Several studies on gifted under achievement point to a connection between student learning styles and classroom performance. This study examined the learning styles of gifted middle school students, student perceptions of the classroom environment, and possible connections between learning styles, classroom environment, and achievement levels. Results indicated that the LSI elements of persistence and lighting correlated with achievement in all content areas. Additionally, correlations between higher grade point averages (GPA) and LSI preferences for responsibility and teacher motivation were found in science and math classes. Results of the SPI revealed a correlation between higher grade point averages in social studies and science classrooms and the following items: persistence; motivation; and auditory, tactile, and kinesthetic modalities. All subject areas showed a correlation between higher GPA and the students' perceived level of persistence. They have a high preference for tactile and kinesthetic learning activities; these students are more likely to remain motivated and engaged when they are active participants in the discovery process.

Smith (2005) attempted to find out “Can Accelerated Reader and Cooperative learning enhance the reading achievement of high school students”. This applied dissertation was designed to provide teachers with interventions that may help improve the reading achievement of level 1 students on the Florida Comprehensive Assessment Test (FCAT) reading scores of 10th grade students. The interventions that were implementation in this study were cooperative learning and the AR programme. An analysis of the data revealed that using cooperative learning coupled with the AR
programme did in fact increase students reading achievement, thereby increasing the scores of the degrees of reading power.

**Pearson, Jeremy** (2005) made a study on “The relationship of social skills and learning behaviors to academic achievement in a low income urban elementary school population”. The purpose of this study was to examine the relationship between the ability, social skills, learning behaviours and gender and the academic achievement of the children who attend a low income urban elementary school I Baltimore, Maryland. The participants in the study included 72 students who attended 1st and 2nd grade and their teachers in this low-income elementary school in Baltimore. Each teacher completed the social skills sections of the social skills rating system (SSRS) and the Learning Behavior Scale. Each student was assessed on the Otis Lehnon School Ability Test-(OLSAT-8) and his or her achievement scores from the Stanford achievement test-10 (Stanford 10) were assessed. In findings the resulting model comparison indicated that school ability and learning behaviors both have significant direct effects on academic achievement. School ability and social skills were found to have significant direct effects on learning behaviors.

**Bielaczye** (1994) studied “Learning through student-generated explanations’. The dissertation contributes to the development of learning theories and educational environments by advancing our understanding of individual and collaborative learning processes. The approach involves characterizing the types of explanation and met cognitive activities that learners engage in during initial skill acquisition, identifying specific activities related to successful learning and problem solving, and investigating strategy training and collaborative interactions as means for promoting learners use of effective explanation and Meta cognitive activities. Two empirical studies were conducted. Both studies involved experimental manipulations within similar sequences of programming lessons. Subjects were university students with no prior programming experience (study 1: N=24; study 2: N=25). This research found positive correlations between particular strategies students use to explain instruction to themselves while studying and associated problem solving performance.
Ahuja (1994) studied “The effects of a cooperative learning instructional strategy on the academic achievement attitudes toward science class and process skills of middle school science students”. Co-operative learning experience has been shown to have positive effects on the academic achievement, self esteem, inter-racial and cross sex relations attitudes, and motivation of science students. The purpose of this study was to determine whether the use of a cooperative learning instructional strategy would influence the academic achievement, attitudes toward science class, and process skills of middle school science students. A secondary purpose was to determine whether these outcomes were related to the gender of the student and time of day the class was held. The sample consisted of five seventh grade classes (116 students) were randomly assigned to the experimental group which was exposed to cooperative learning experiences. Findings from the analysis of covariance on the posttests scores indicated that the use of a cooperative learning instructional strategy resulted in greater academic achievement and better attitudes toward science class of these students. The process skills were not influenced by the instructional strategy. Six students were purposefully selected on basis of their responses on the attitudes checklist for interviews. Responses from the interviews collaborated the findings that cooperative learning experience is looked upon more favourably by middle school science students, who find that it helps improve their perceptions of science, makes science learning more fun, and improve their learning.

Martin (1992) hypothesized that episode memories of students medicate learning from instructional interventions because of the personal associations carried with them. This study investigated the role of episodic memories of Grade 6 students in mathematics instruction, especially with respect to the possible mediation of students learning, and knowledge were investigated as possible factors that affect recall episodic memories from classroom instruction. Study 1 assessed the suitability of two learning styles inventories for use with a Grade 6 sample. The individual difference questionnaire was found to be a good measure for verbal/imaginable encoding, and the inventory of learning process was found to be an adequate of learning styles related to theories of information processing. In study 2, students completed an attitude toward mathematics inventory, tests of prior
knowledge and achievement and were required to list their episodic memories for classroom instruction. Initial support for the meditational hypothesis was not seen in the study. Although expected, encoding preference did not affect scores on the post tests. Instruction may not have varied enough to allow students with either preference to benefit. As a result study 3 manipulated the amount of imagery used during instruction to determine if such a manipulation affected recall of information presented. Students who preferred to encode verbally did better on post—tests of achievement in the verbal condition. Students who prefer to encode imaginably recalled more episodic memories in the condition. Although the predicted main and interaction effects of imagery were not significant, limited support for the meditational hypothesis was found in the form of a correlation between recall of instructionally relevant episodes and score on the post-test. Deep processors tended to perform well on the post tests and elaborative processors tended to perform poorly. Implications for episodic memory in classroom instructional research and practice are discussed in the light of the findings from all three studies.

2.4 STUDIES ON SCHOOL CLIMATE
2.4.1 Indian Studies on School Climate

Nalini.S and Doreen Gnanam (2015) studied the various dimensions of School Environment on Academic Achievement in Biology among higher secondary students. The objectives of the study were: (1) to analyze the perceived School Environment and Academic Achievement in Biology among Higher Secondary Students based on Gender. (2) to find out the significant difference between the dimensions of School Environment and Academic Achievement in Biology among Higher Secondary Students based on Type of Management. (3) to find out whether the dimensions of School Environment of Higher Secondary students is significantly related to their Academic Achievement in Biology. The sample consists of 1200 XI Biology students from Chennai and Ponneri Educational Districts. The scales used for the study consists of the School Environment Inventory by Karuna Shankar Misra (2002) and Academic Achievement in Biology Questionnaire prepared by the investigator. The major findings of the study that girls exhibit higher perception of School Environment and Academic Achievement in Biology than that of boys, dimensions like Cognitive Encouragement, Acceptance, Permissiveness
Beulahbel Bency, P. B., and Krishna Prasad (2013) studied the effect of school environment on academic achievement of secondary school students. The objectives of the study were: (1) to study the mean difference if any, between male and female secondary school students on school environment and academic achievement, (2) to study the mean difference if any, between rural and urban secondary school students on school environment and academic achievement, (3) to study the mean difference if any, among different religious groups of secondary school students on school environment and academic achievement, (4) to study the mean difference if any, between the government and private secondary school students on school environment and academic achievement, (5) to study the relationship between the school environment and academic achievement of secondary school students. The investigator adopted normative survey method for, conducting the study. The study was conducted on a sample of 400 secondary school, students. The findings of the study were: (1) the male and female students significantly differ in their school environment; (2) the rural and urban students significantly differ in their school environment. Rural students have healthier school environment than urban students; (3) the Hindu and Christian, Christian and Muslim, Hindu and Muslim students significantly differ in their school environment; (4) the government and private school students significantly differ in their school environment. Government school students have better school environment than private school students; (5) the male and female students significantly differ in their academic achievement. The female secondary school students showed higher level of academic achievement than the male students; (6) the rural and urban students did not differ significantly in their academic achievement; (7) the Hindu and Christian students significantly differ in their academic achievement. The secondary school students belonging to Hindu religion exhibited higher level of academic achievement than the Christian students. The Christian and Muslim students did not
differ significantly in their academic achievement. The Hindu and Muslim students significantly differed in their academic achievement; (8) the government and private school students significantly differed in their academic achievement. Private school students had better academic achievement than government school students and (9) there is significant positive relationship between school environment and, academic achievement of secondary school students.

Arul Lawrence, A. S., and Vimala, A. (2012) conducted a study on school environment and academic achievement of standard IX students. The major objectives of the study were: (1) to find out the significance difference between standard IX boys and girls in their school environment, (2) to find out the significance difference between standard IX English and Tamil medium students in their school environment, (3) to find out the significance difference between standard IX rural and urban school students in their school environment, (4) to find out the significance of difference between standard IX boys and girls in their academic achievement, (5) to find out the significance of difference between standard IX English and Tamil medium students in their academic achievement, (6) to find out the significance of difference between standard IX rural and urban school students in their academic achievement, and (7) to find out the significant relationship between the school environment and academic achievement of standard IX students. The investigators used stratified random sampling technique for selecting the sample. The sample consists of 400 standard IX students. The major findings of the study were: (1) there is no significance of difference between standard IX boys and girls in their school environment, (2) there is no significance of difference between standard IX English and Tamil medium students in their school environment, (3) there is a significant difference between standard IX rural and urban school students in their school environment, (4) there is no significance of difference between standard IX rural and urban school students in their school environment, (5) there is a significant difference between standard IX boys and girls in their academic achievement, (6) there is a significant difference between standard IX English and Tamil medium students in their academic achievement, (7) there is no significant relationship between the school environment and academic achievement of standard IX students.
Gurumoorthi.G., and Mani, S. (2012) conducted a study on teaching styles, learning styles and school environment in higher secondary schools. The major objective of the study were: (1) to find out the level of school environment among higher secondary school environment, (2) to find out the significant differences in school environment of higher secondary students with respect to gender, (3) to find out the significant differences in school environment of higher secondary students with respect to the subject of the study, (4) to find out the significant differences in school environment of higher secondary students with respect to the medium of instruction, (5) to find out the significant differences in school environment of higher secondary students with respect to communities, (6) to find out the significant differences in school environment of higher secondary students with respect to religion, (7) to find out the association between learning styles of higher secondary students and school environment of higher secondary schools, (8) to find out the relationship between teaching styles of higher secondary school teachers and school environment of higher secondary schools. The sample population consisted of 300 higher secondary school students and teachers. The major findings of the study were: (1) it was found that the higher secondary school environment is good, (2) it was found that there is no significant difference in school environment of higher secondary school students with respect to gender, (3) it was found that there is significant difference in school environment of higher secondary school students with respect to the subject of the study, (4) it was found that there is no significant difference in school environment of higher secondary school students with respect to the medium of instruction, (5) it was found that there is no significant difference in school environment of higher secondary school students with respect to communities, (6) it was found that there is no significant difference in school environment of higher secondary school students with respect to religion, (7) it was found that there is association between learning styles of higher secondary students and school environment of higher secondary schools and (8) it was found that there is no correlation between teaching styles of higher secondary school teachers and school environment of higher secondary schools.
Richa Sharma (2012) studied the effect of school and home environments on creativity of children. The objectives of the study were: (1) to find the creativity level of government and private secondary school children, (2) to find the creativity level of boys and girls, (3) to find the difference in the creativity of children due to creative stimulation dimension, cognitive dimension and permissive dimension of school environment, (4) to find the creativity level of children with rich and poor home environment. The study was conducted on a random sample of 200 ninth class students of Chandigarh. The major findings were: (1) the school environment of government and private schools of Chandigarh did differ with respect to Creative Stimulation, Cognitive Encouragement and Permissiveness dimensions of school environment, but did not differ significantly with respect to Rejection, Acceptance and Controlled dimensions; (2) the government schools of Chandigarh provide greater creative stimulation to their students as compared to those studying in the private schools. Whereas students in the private schools feel greater rejection in their schools as compared to those in government schools; (3) as regards the comparison of creativity of the school students with their school environment, it can be concluded that the government schools of Chandigarh have higher creativity generating environment as compared to private schools of Chandigarh.

Maxwell.Benjamin.B and Anandhan.K (2011) studied “Influence of Organizational Climate on the Prevalence of Moral Values among the Higher Secondary Students in Chennai City”. Today’s young people are facing innumerable Value Problems. Do the School and Home Environment help to develop Moral Values among children? Thus, this study attempts to ascertain influence of Organizational Climate on the prevalence of Moral Values among the Higher Secondary students in Chennai city. The investigator suitably located and identified 44 related studies. Out of this, 24 studies were conducted in India and 20 studies were conducted in abroad. In this study Stratified Random Sampling Technique was followed and the data were collected from 1446 students in 20 schools. The present study belongs to Normative Survey research. The variables used in the study were Moral Values, Academic Achievement, Organizational Climate: School Climate and Home Environment and Demographic Variables: Sex, Parent’s Educational Qualification, Parent’s Profession, Parent’s Monthly Income, Type
of Management, Type of School and Major subject groups. Tools used in the study were Questionnaire developed by the investigator to measure the Moral Values among school students and two Standardized Tools used to measure Organizational Climate known as School Environment Inventory and Home Environment Inventory. Different statistical measures were used in the study for finding out solutions to the problems. The Statistical Techniques were: Mean Average, Mean, Standard Deviation, ‘t’ test and correlation coefficient ‘r’. The major findings are: the children have good Moral Values and normal Academic Achievements irrespective of High, Moderate and Low School Climate and Home Environment. The Female students have better Moral Values and Academic Achievements than the Male students.

Karthikeyan, P., and Mani, S (2010) conducted a study on school environment and values among high school students. The objectives of the study were: (1) to find out the level of high school environment and overall values of high school students, (2) to find out the significant difference among the high school students in the perception of their school environment, overall values and its dimension with respect to gender, (3) to find out the significant difference among the high school students in the perception of their school environment with respect to community, (4) to find out the significant difference among the high school students in the perception of their school environment, overall values and its dimension with respect to medium of instruction, (5) to find out the significant difference among the high school students in the perception of their school environment, overall values and its dimension with respect to pattern of schools, (6) to find out the significant difference among the high school students in the perception of their school environment with respect to nature of schools, (7) to find out the significant difference among the high school students in the perception of their school environment, overall values and its dimension with respect to type of family. A sample of 300 students at high school level from three different types of school was selected randomly by stratified random sampling technique. The major findings of the study were: (1) it was found that the high school environment and overall values of high school students are satisfactory in nature as perceived by high school students, (2) no significant difference was found among the high school students in the perception of their school environment
with respect to gender, (3) no significant difference was found among the high school students in the perception of their school environment with respect to community, (4) no significant difference was noticed among the high school students in the perception of their school environment, overall values and its dimensions with respect to medium of instruction, (5) significant difference was observed among the high school students in the perception of their school environment with respect to pattern of schools (6) no significant difference was noticed among the high school students in the perception of their school environment with respect to nature of schools and (7) no significant difference was observed among the high school students in the perception of their school environment, overall values and its dimension with respect to type of family.

**Gaiab, S. et al.** (2008) conducted a study on child learning in Andhra Pradesh, the interplay between school and home. The major objectives of the study were: (i) to compare learning outcomes for children in private and public schools in consideration to sex, wealth, and caste; and (ii) to assess the influence of a caregiver's own education on their children's learning outcomes, in both private and public schools. The data were collected as part of the baseline survey for the young lives project. The respondents were 1,008 mothers and children aged 7.5-8.5 years at the time of the survey and sampled across the 3 district agro-climatic regions of Andhra Pradesh (Costal AP, Royalaseema and Telengana) from sentinel sites. The major findings were: (1) children in private schools have better literacy and numeric skills regardless of wealth or caste than the children in public schools. (2) children with illiterate parents (especially mothers) are at disadvantage. (3) this disadvantage is greater in public schools than private schools. (4) girls have lower learning scores than boys. Furthermore, there is a clear interplay between school and home in every aspect.

**Vishwakarma Ram Swaroop** (2008) studied the impact of school environment on learning behaviour and academic achievement of the students of Chhatarpur District. The major objectives of the study were: (i) to get information about urban government and non-government upper primary school environments. (ii) to know about learning behaviour of urban government and non-government upper primary school students. (iii)
to get information on academic achievement of urban government and non-government upper primary school students. (iv) to find the impact of school environment of urban government upper primary school students. (v) to find students' academic achievement under the impact of urban government upper primary school environment. The study was conducted at 115 government and non-government upper primary schools students, boys and girls, in all eight blocks of the revenue district of Chhatarpur in the State of Madhya Pradesh. The schools were chosen in randomly and quota sampled from all eight blocks of the district of Chhatarpur. Altogether 1500 boys and 1500 girls were selected randomly from urban and rural areas maintain a balance between government and nongovernment upper primary schools. Psychological survey method and documentary survey method was taken up for the purpose of the present study. The major findings were: (1) the impact of rural non-government upper primary school environment is more on boys than on girls in comparison to the environment of rural government upper primary schools. (2) the impact of rural non-government upper primary schools' learning behaviour is higher on boys and girls in comparison to rural government upper primary schools' learning behaviour. (3) the impact of school environment on learning behaviour of the boys and girls of urban non-government upper primary schools is higher. (4) the impact of school environment on academic achievement of the boys and girls of the urban government upper primary schools is higher.

Chamundeswari, S., and Ezhilarasi, A. (2006) conducted a study entitled an environment among students at the secondary level in different types of schools. The objectives of the study were: (1) to investigate the possible difference between the levels of presence of factors related to home environment among boys and girls at the secondary level in different types of schools, (2) to investigate the difference between the levels of presence of factors related to home environment among students at the secondary level in different types of schools, (3) to investigate the difference between the levels of presence of factors related to school environment among boys and girls at the secondary level in different types of schools, (4) to investigate the difference between the levels of presence of factors related to school environment among students at the secondary level in different types of schools. A sample of 200 students (94 boys and 106 girls) at the
secondary level from four different types of school was selected randomly by simple random sampling technique. The major findings of the study were: (1) there is no significant difference between the levels of presence of factors related to home environment among boys and girls at the secondary level in different types of schools, (2) there is a significant difference between the levels of presence of factors related to home environment among students at the secondary level in different types of schools, (3) there is a significant difference between the levels of presence of factors related to home environment among students at the secondary level in government and government-aided; government and private; government-aided and private; Corporation and Private schools and there is no significant difference between the levels of presence of factors related to home environment among students at the secondary level in government and corporation; government-aided and corporation schools, (4) girls have higher level of presence of factors related to school environment than boys at the secondary level in different types of schools, (5) there is a significant difference between the levels of presence of factors related to school environment among students at the secondary level in different types of schools, (6) there is a significant difference between the levels of presence of factors related to school environment among students at the secondary level in government and government-aided; government-aided and corporation; government-aided and private schools; and there is no significant difference between the levels of presence of factors related to school environment among students at the secondary level in government and corporation; government and private schools.

Champa, P. (2005) conducted a study entitled school effectiveness and teachers profile: A study of elementary schools. The study was aimed at identifying the effectiveness of schools on the basis of perceptions of stakeholders of education at various levels of educational administration as well as teachers and parents. The effectiveness of these schools was measured through the criteria developed on the basis of input-process, output-framework. In the study both quantitative and qualitative methods, along with case study approach were used. The sample of this study has been selected from among the primary class students in Delhi. The major findings were: (1) in an effective school the teachers are punctual, the HM has effective leadership, discipline
is well maintained, basic infrastructure and facilities are available, all the students are treated equal, examination results are good and students achieve high levels of learning and develop good habits and manners. (2) the criteria for measuring school effectiveness are the various aspects of input process and output of the schools. (3) the teachers profile in the effective school includes high qualification, rich experience, high economic status, favorable attitude towards teaching professional, high job satisfaction, high motivation at their work place and high professional commitment.

Dwivedi, R. D. (2005) conducted a study on the influence of school environment and approval motive on academic achievement of students. The major objectives of the study were: (i) to compare educational attainments of students belonging to different categories of schools according to their environment and (ii) to observe variability of achievement of high approval seekers and low approval seekers, coming from different institutions. The sample consisted of 400 class X students drawn randomly form sixteen different institutions situated in Gorakhpur and Varanasi regions of Uttar Pradesh. The major findings were: (i) the students from schools with enriched environment had significantly better academic achievement than the students from poor school environments. (ii) the students who were high approval seekers had great academic achievement than the students who were low approval seekers. (iii) academic achievement of students of the urban schools was significantly higher than that of students of the rural schools.

Saha, K. (2005) conducted a study on the influence of School Environment on cognitive development. The major objectives of the study were to study the influence of School Environment on cognitive development. The sample comprised of 160 children (Boys 20 Girls 80) of classes 1 to IV – 20 boys and 20 girls from each classes. The sample was selected from 7 different schools on the basis of the availability of children of both sexes in the same school. The findings of the study showed how the school environment exerted positive influence on cognitive development of children.
Saswoti Baruah (2004) did a study on “Organizational Climate of Government and privately managed High Schools of Kamrup District”. The objectives of the Study were to identify whether Government and Privately Managed high schools manifest variation in their Organizational Climate. To identify those components on which different schools are stronger or weaker. To determine whether any relationship exists between the type of school and teacher job satisfaction. To determine whether the type of school bears any positive relationship with Student’s Achievement. The ultimate objective of the study is to make a comparative analysis between Government and Private secondary schools of Kamrup district of Assam. A sample of 56 Government Schools and 19 Private Schools were drawn for the study. From each school the data were gathered from the Principal and 5 teachers. The Tools used in the study were Organizational Climate Questionnaire was used by the investigator adopted on the Basis of Organizational Climate Development Questionnaire (OCDQ) originally devised by Halpin and Croft. The data gathered through OCDQ were first interpreted in the percentile form on each dimension. The study has arrived at quite meaningful findings. The Organizational Climate of the Secondary Schools of Kamrup district differs from one another. There seems to be no relation between the climate and variables like Qualification and Experience of the teachers. Private schools were found to have an edge over the Government schools in some of the infra-structural facilities. There is too much of political influence in the appointment of teachers of the Government schools, but which is not the case in Private schools. Academic achievement of the Private school students is much higher than that of the Government school students.

Sucharita Parida, (2003) conducted a study on “Effect of Socio-Economic Status, School Environment and medium of instruction on the mental abilities and Academic Achievement of school Children”. The objectives of the Study were to assess the Socio-Economic background of the school students and categorize them as per the intra-variables. To assess the environmental conditions available in different institutions. To compute the level of Academic Achievement of the students with intra-variables. To examine the effect of the predicting variables of SES, School Environment and Medium of Instruction on the criterion measure of mental abilities and Academic Achievement.
The study is ex-post-facto causal comparative. The Random Sampling Technique adopted by the investigator for drawing the sample of 325 Boys and Girls from two types of Management in Government schools and Non-Governmental schools of Oriya and English Medium schools is quite appropriate. The Tools used in the study were Intelligence Test by Mishra (1984) and SES Scale and School Environment Scale by the Investigator. The data have been analyzed using appropriate Statistical Techniques, both descriptive and inferential. Mean, Median, Mode, SD, t-value and F-value, coefficient of correlation and coefficient of multiple determinations have been accurately computed and well interpreted.

The main findings of the study were the mental abilities of the respondents have been found homogeneous in case of Sex and Medium of instruction variation, but heterogeneous in case of schools under different management and different School Environmental conditions. There existed significant difference in Academic Achievement of the respondents, of the sub-samples due to Management, Medium of Instruction and School Environmental conditions. But there did not exist any difference in the Academic Achievement of Boys and Girls. In differential analysis of the data on mental abilities and Academic Achievement with respect to SES, it was found that both mental abilities and Academic Achievement of the respondents differed significantly due to SES variation. The schools having high level of teacher input, material input, and process input along with adequate schooling facilities were found to contribute significantly in the development of mental abilities and Academic achievement. There did not exit any difference in the Mean mental ability scores of the respondents due to medium of instruction variation. But Academic Achievement of the respondents was influenced greatly due to Medium of Instruction.

Arockiasamy, S., and Jebasheela (2001) studied then higher secondary students; perception of school environment and its impact on their academic achievement in matric and non-matric schools. The major objectives of the study were: (1) to find out whether there is any significant difference in the school environment as per by higher secondary students in matric and non-matric schools, (2) to find out whether there is any significant
difference in the academic achievement of higher secondary matric and non-matric students, (3) to study whether school environment has exerted significant impact on the academic achievement of higher secondary students in matric and non-matric schools. Survey method has been employed for collection of the required data. Students of various schools were used for study. 100 items were taken for this study. The findings of the study were the non-matric higher secondary students enjoy better school environment in total with regard to the dimensions, academic, activity, Psychosocial and administrative environments. As the Matric School is result oriented and much work is extracted from the students, they do not seem to enjoy the school environment. As far as academic achievement is concerned the matric school student are far better than their counterparts.

Kumaran, D. (2001) aimed to study of “Organizational Climate and Academic Performance of Higher Secondary Schools”. He used multistage random sampling procedure and selected from 27 schools and 375 teachers as sample. Wayna. Hoy K. John C Tarter and Robert Bikottkamp (OCDQ) for secondary school as conceived by Halpin and Croft (1963) was used as tool. For purpose of measuring Academic performance of the schools, they grouped into Low, Average and High. The study revealed that the overall Organizational Climate was found to be high. The schools do not differ significantly with respect to the type and categories of schools and the schools differed significantly with respect to their Academic achievement as Low, Average and High performance and overall Organizational Climate of the schools.

Ramesh (2000) conducted a study on the influence of School Environment and Approval motivation on academic achievement of students. The objective of the study were: (1) to compare education attainments of students belonging to different categories of schools according to their environment, (2) to observe variability of achievement of high approved seekers and low approval seekers, coming from different institution. The sample consisted of 400 classes X students drawn randomly from 16 different institutions situated in Gorakhpur and Varanasi religions of Uttarpradesh. The findings of the study were: (1) the students from schools with enriched environment have significantly better academic achievement than the students from poor environment, (2) the students who
were high approved seekers had significant greater achievement than the students who were low approval seekers, (3) academic achievement of students of the urban schools was significantly higher than that of student of the rural schools.

**Dhar and Dubey** (1989) studied effect of school environment and approval motive on memory and achievement. The study aims to examine the relationship between school environment, approval motive and achievement. Its objectives were as follows; 1. to develop a tool to measure school environment. 2. to compare the achievement of student belonging to schools with different environment. The sample consisted of 490 students including science and arts from sixteen colleges of Gorakhpur and Varanasi regions selected through stratified random method. The tools used to collect data included School Environment Scale (SES). Recall test of Memory prepared by the researcher, Approval Motive Scale (AMS) of L.B. Tripathi and N.K.M Tripathi, Intelligence test of Jalota and Socio- Economic Status Scale (SESS) of Kulshrestha. The data were analysed using 510, correlation coefficient and three-way analysis of variance. They found, 1. the means of arts students in academic achievement and in Hindi were found to be below 50 percent of the aggregate marks, 2. the mean performance of the science students in academic achievement as well as in Hindi was found to be satisfactory. The majority of science students secured 50 percent of the aggregate marks. 3. the distribution of scores of students in four selected variables, i.e., school environment, approval motive, academic achievement and memory scores on different recall tests were found to be approximately normally distributed. 4. the main effects of all the three treatments, i.e., school environment, school location and approval motive were found to be significant on academic achievements of the arts students.

**Grewal** (1988) conducted a “Study of the perceptions of the secondary school learning environment by the students, staff and administrators”. Students in learning environment have generally been conducted on students’ perception. This investigation has attempted to extent the area from the point of new teachers who are to play a major role in the educational system. Its objective was as follows: to study the perception of the learning environment of the schools by the students, teachers and administrators. For this
study, the Learning Environment Inventory developed by Walberg was used with adaptations. The learning environment was studied in terms of location of school, type of school, school management, medium of instruction and state of the region. The data was collected on 17 teachers from the four states of the western region Madhya Pradesh, Maharashtra, Gujarat and Goa. The sample was incidental since all the teachers were undergoing the final year of on-the-job teacher training course. Teachers’ perception of each component was analyzed. However, students and staff sample were not considered for final analysis. Perception scores on school locality were subjected to analysis. Perception scores on school locality were subjected to analysis of variance and the chi-square test was applied for determining the significance of the difference on each item. They found 1. Out of the five components of the school learning environment, only two were found to be different for groups. 2. On activity environment, the schools were differentiated by area and medium, whereas in terms of academic environment the schools differed by medium alone. The psycho-social dimension of school environment demonstrated that group differences did not exist, but the school in all groups perceived as highly heterogeneous in psycho-social environment.

Mukhopadhay (1988) studied identification of school climate and study of its effects on the scholastic achievement and development of certain personality characteristics of students of secondary schools. The present study addresses the problem of identification of school climate and its impact on scholastic achievement of students and their personality development. Its objectives were as follows; 1. To identify the determinants of school climate. 2. To examine the effect of school climate on scholastic achievement of students. All the secondary aided schools of the districts Birbhum and Burdwan constitute the population. The sample consisted of 51 schools which is 10 percent of the population. Stratified random selection was made with subdivision-wise distribution, sex and location as the basis for stratification. School-climate Description Questionnaire constructed by the investigator was used as a tool. Correlation, cluster analysis, profile for a cluster, significance of difference in the mean determinant measure between cluster of schools and chi-square test to measure the effect of school climate on the development of personality characteristics were used to analyze the data. They found
out of the nine determinants of school climate ‘headmaster-staff’ relationship administrative capacity of the headmaster teachers’ job satisfaction and physical facility of the school were found to contribute significantly. The order determinants, viz, close supervision by the headmaster, teacher-student relationship, teacher-teacher relationship; dutifulness and punctuality of teachers and student-student relationship were found not to be statistically significant.

Patel (1987) studied “Dimension of classroom environment”. The objectives of the study were as follows: 1. to find out the different dimensions (factors) responsible for building classroom environment. 2. to prepare a scale to measure the classroom environment of different classrooms of secondary schools of Gujarat state. 3. to classify the classroom environment such as open-environment, intermediate environment and closed environment on the basis of obtained score on a prepared classroom environment scale.

A pilot study was carried out on 200 students studying in STD X of four secondary schools of Surat for item analysis. In the final draft there were 102 students. It was administered to 2594 students of STD VIII, XI and X of 22 secondary schools of five district of Gujarat state.

They found 1. classrooms were classified as open, intermediate and closed in terms of the environment of classroom. Data analysis supported variation of number of classrooms in different categories of classroom environment. 2. data did not support the association among different categories of classroom environment with respect to area, which is rural and urban. 3. open classrooms were maximum in North Gujarat. Closed classroom were maximum in North Gujarat. The proportion of intermediate classroom was almost the same in all the regions. 4. the classroom environment scores of students of different standards differed. 5. there was a significant difference in the boys and girls on classroom environment scores. 6. the difference obtained on mean classroom environment scores of pupils of different levels of parents’ education was significant. 7. the difference on mean classroom environment scores of pupils whose parents’
occupation was service and students whose parents’ occupation was business was not significant. There was significant difference in mean classroom environment of pupils belonging to three categories of achievement.

Prakasham, D.A (1986) conducted a study on “Teacher Effectiveness as a function of School Organizational Climate and Teaching Competency”. The objectives of the study were (i) to study the effect of school organization climate on teacher effectiveness, (ii) to study the effect of teaching competency on teacher effectiveness, and (iii) to study the effect of School Organizational Climate on teaching competency. The sample of the study consisted of 800 teachers teaching in classes IX, X and XI of different higher secondary schools of Raipur and Bilaspur districts of Madhya Pradesh, along with 92 principals of these schools. In all 504 teachers were teaching in Government schools, 73 in local body schools, 163 in Private, Non-Christian schools, and 60 in Christian schools. The relevant data were collected by employing the School Organizational Climate Description Questionnaire by Moti Lal Sharma, the General Teaching Competency Scale by Passi B.K and Lalitha M.S, and the Teacher Effectiveness Scale by Parmod Kumar and Mehta D.N. Mean, T-Values, coefficient of correlation, ANOVA and F-ratios were computed for analyzing the data. The findings of the study were: 1. Teachers working in an Open School Climate were better in teaching competency and teacher effectiveness that those employed in schools with Autonomous, Familiar, Controlled, Paternal and Closed Climates. 2. Teachers working in schools situated in industrial areas were found better in teaching competency than teachers working in semi-Urban and rural, areas whereas teachers of semi-Urban and rural areas were better in teacher effectiveness than the teachers of industrial areas. However, teachers working in schools situated in urban areas were better than teachers of all other areas on both teaching competency as well as teacher effectiveness. 3. No significant difference was found in the teaching competency and teacher effectiveness of the teachers working in Government and Non-Government schools in global terms. However, teachers working in schools run by local bodies were found better in teacher effectiveness and teaching competency than those working in Government schools, Christian schools and Non-Christian schools. 4. No significant difference was observed
between Male and Female teachers on the tests or teaching competency and teacher effectiveness on the global scale though Female teachers were found moderately better in teaching competency under all types of variations, whereas, they were found moderately better than Male teachers in teacher effectiveness only under Christian management. In other types of variations no significant differences were observed in the teacher effectiveness of Male and Female teachers.

Dholakia (1985) conducted “A study of classroom climate and pupil growth, construction of tools and survey”. The broad objectives of the study were 1. to construct a tool to measure classroom climate and battery of tools to study pupil’s growth. 2. to survey the classroom climate. 3. to study the pupil’s growth at macro and micro level. 4. to identify parameters for diagnostic and prognostic utility and 5. to enunciate a practical instructional strategy for a typical Indian classroom. The sample consisted of 75 pupils of class XI of two secondary schools of Baroda. The sample size varied in case of construction of various tools. For surveying the classroom climate, the sample was drawn from class X of 14 secondary schools of Baroda (N-572). The researcher constructed tools to measure pupils’ anxiety, motivation, adjustment, fulfillment and a tool to measure classroom climate. They found 1. The traits of Anxiety and Motivation in pupils did not change with time whereas Adjustment and Fulfillment altered with time. 2. pupils showed confirmed trust in classroom teaching and they enjoyed going to school. 3. the pupils felt that their teachers performed their duties with no sense of belongingness and did not care for the pupils’ expectations. 4. the school authorities did not recognize the value of projects and identification of learnt.

Mohan Rao, C.N.S. (1985) conducted a study “An Evaluation of the Factors that Affect the Teacher Morale in School Setting”. The objective of the study was to make an evaluation of the various factors that affected teacher Morale. School Environmental factors, viz., human relations, Academic facilities and physical facilities influence teacher Morale. Of the factors relating to professional growth and factors relating to School Environment, the School Environment factors affect teacher Morale. Teaching done through the adoption of the latest techniques of teaching elevates teacher Morale. The
personal characteristics of the teacher affect teacher Morale. Active participation in school programs affects teacher Morale. Satisfaction with teaching improves teacher Morale. Good human relations, viz., relations with Pupils, Colleagues, Superior’s Non-Teaching Employees and Parents, Affect Teacher Morale. Academic facilities, such as availability of Teaching Aids, Library Facilities, Laboratory Facilities, etc. improve teacher Morale. Effective classroom management results in better teacher Morale. The study employed the normative survey method of research. The total sample included 400 teachers working in secondary schools of Srikakulam, Visakhapatnam, and East Godavari districts of Andhra University. The Stratified Sampling Technique was employed. Six variables, viz., Sex, Educational Qualifications and Designation of a Teacher, Teaching Experience, Nature of School Management and Locality were considered for drawing the sample. A Secondary School Teacher Morale Opinionnaire-I (SSTMO-I) was constructed on the lines of the Likert method of summated ratings and another tool, viz., a Secondary School Teacher Morale Opinionnaire-II (SSTMO-II). The Statistical Techniques of Central Tendency, Variability, Skewness, Kurtosis, t-Ratio, ANOVA and Correlation were employed for the analysis of the data. Some of the major findings were: Six factors, viz. Academic Improvement, Change Proneness, a Vocational Activities, Teaching Load, Recognition and Personal Characteristics, which belonged to the major factor of Professional Growth, Influenced Teacher Morale. Factors such as Student Performance Assessment, Relations with Pupils, School Facilities (physical), participation in school programs, relations with non-teaching employees, had no marked effect on teacher Morale. Factors relating to School Environment revealed that the maintenance of good human relations with Colleagues, Parents and the Immediate Superior affected Teacher Morale in the School Setting. Academic facilities provided in the school for effective teaching influenced teacher Morale. There was no significant difference in the opinions expressed by teachers with different Qualifications, Working under different Managements and Localities with varied experience, on the factors relating to Professional Growth and factors relating to School Environment.
Saxena (1983) conducted “A study of the influence of some selected aspects of school learning environment on student characteristics”. The objectives of the study were as follows: to explore those learning environment variables which have a bearing on the development of selected student characteristics. Sample of 1200 students were randomly drawn from 24 higher secondary schools of class XI of Bhopal division which comprised of 700 boys (350 from urban area 350 from rural area). Andersons’ (1973) Learning Environment Inventory (LEI) consisting of 17 learning environment variables which were independent learning variables was administered to the sample selected for the study. Its findings were as follows: The learning environment variables were categorized into four components by factor analysis. The four learning environment variables included class organization, Democratic principles, Group functioning and Alienation from school. While the first three components contributed to the growth of specified students’ characteristics, the fourth component appeared to be affecting adversely the development of student characteristics which were studied.

Sharma (1983) studied “Student morale as a correlate of educational environment in the school”. The objectives of the study were as follows: 1. to find out the correlation between educational environment and morale of students of different types of schools of Chandigarh. 2. to find out the educational environment of the government single-shift of the urban area, private single-shift schools of the urban area and government single-shift schools of the rural area. 3. to identify the students’ morale of government single-shift schools of the urban area, government double shift schools of the urban area, private single-shift schools of the urban area and government single-shift schools of the rural area.

Four different types of schools constituted the sample of study, (a) Government single-shift schools of the urban area. (b) Government double-shift schools of the urban area. (c) Private single-shift schools of the urban area. (d) Government single-shift schools of the rural area.
Three schools of each of these types were taken and from each of these school’s 50 students of class ninth were selected. Thus the sample of study consisted of 12 schools and 600 student of class XI. The sample subjects were administered the following tools; 1. the Educational Environment Questionnaire consisting of 50 questions categorized in seven groups, viz, the school plant and equipment of the building for proper education, the use of curriculum, qualifications of teachers, evaluation of education, school policy, human relations, teacher-student, student-student, principal-teacher and parent—teachers relation and general feeling about the school. 2. the School Morale Scale related to seven aspects of school, viz., school plant, quality instruction and instructional material, administrative personnel, relationship regulation, community support of the school, relationship with other students, teacher student relationship, and general feeling about the school morale. They found there was a positive correlation between educational environment and student morale in the case of private single-shift schools of the urban area. The mean scores on the educational environment of government single-shift school of the urban area were significantly higher as compared to those of government double-shift schools of the urban area. Private single-shift schools of the urban area and government single-shift school of the rural area also significantly differ on mean scores on educational environment. F-ratio was significant in all the seven categorizes of educational environment.

2.4.2 INTERNATIONAL STUDIES ON SCHOOL CLIMATE

Review of literature related to School Environment and other related variables with regard to international context are presented in this section.

Ida Frugard Strom et.al., (2013) conducted a study on violence, bullying and academic achievement: A study of 15-year-old adolescents and their school environment. This study investigated academic achievement among adolescents exposed to violence, sexual abuse and bullying. Moreover, the researchers sought to determine the individual and contextual influence of the adolescents’ school environment in terms of bullying, classmate relationships and teacher support on academic achievement, in addition to assess whether school-level influence is different for the adolescents exposed to violence.
and sexual abuse versus the adolescents not exposed to these forms of abuse. This is a cross-sectional study of a sample of 7,343 adolescents between the ages of 15 and 16 from 56 schools in Oslo, Norway. The researchers investigated the associations between violence, sexual abuse, bullying, classmate relationships, teacher support and academic achievement. Linear regression was used to investigate associations on the individual level. Multilevel analyses were conducted to test for school level differences while controlling for both individual and contextual factors. On the individual level, all combinations of violence and sexual abuse categories were significantly associated with lower grade. This was also true for bullying, while teacher support resulted in better grades. At the school level, the analysis showed that students in schools with higher levels of bullying performed worse academically. Each unit of increment in bullying in school corresponded to an average 0.98 point decrease in grades when we controlled for socio demographic characteristics. The association remained significant when the model was tested separately for the non bullied students, with a small reduction in the coefficient value. No overall significance was found for the interaction between the school environment and adolescent exposure to violence, indicating that the school environment affects all students.

Ivory, A., Toldson and Brianna, P., Lemmons (2013) conducted a study on social demographics, the school environment, and parenting practices associated with parents’ participation in schools and academic success among Black, Hispanic, and White students. This study explored social demographic factors, school environmental factors, and parenting practices that are associated with child academic success and school-based involvement among the parents of Black, Hispanic, and White students. Analysis of 12,426 parents who completed the national household education surveys-parent and family involvement survey revealed that parent's participation in school is linked to better grades and is associated with supportive schools and positive parenting practices. The study also revealed that parents who were Black and Hispanic, non-native English speakers, lived in unsafe neighborhoods, and had less than a high school education were less likely to visit the school.
Leonidas Kyriakides and Bert P. M., Creemers (2012) studied the school policy on teaching and school learning environment: Direct and indirect effects upon student outcome measures. It is a longitudinal study in which 50 primary schools, 108 classes, and 2369 students participated and generated evidence supporting the validity of the dynamic model. This study reports the results of a re-analysis of the data of this study in order to search for direct and indirect effects of school factors included in the model. Using multilevel structural equation modeling techniques, indirect effects of school policy on teaching and school learning environment upon achievement in mathematics and Greek language are demonstrated.

Cynthia, L. Uline et. al., (2010) studied on improving the physical and social environment of school: A question of Equity. This study explored the interplay between quality facilities and school climate, charting the effects of facility conditions on student and teacher attitudes, behaviours, and performance within schools slated for renovations in a large metropolitan school district. The research applied a school leadership building design model to explore how six characteristics of facility quality movement, aesthetics, play of light, flexible and responsive classrooms, elbow room, and security-interact with four aspects of school climate: academic press, community engagement, teacher professionalism, and collegial leadership. Because, the schools were older and participants in the research perceived them as being in great need of maintenance and repair, the school building characteristics were often described as absent qualities. The survey data revealed moderate to strong relationships between the quality of school facilities and school climate.

Ming-Te wang and Rebecca Holcombe (2010) studied the adolescents Perceptions of School Environment, Engagement, and Academic Achievement in Middle school. This short-term longitudinal research examined the relationships among middle school student’s Perceptions of school environment, school engagement, and academic achievement. Participants were from a representation ethnically diverse, urban sample of 1,046 students. The findings supported the theoretical conceptualization of three different -but related dimensions of school engagement school participations sense of
identification with school, and use of self-regulation strategies. The result also indicated that students’ perceptions of the district dimensions differentially to the three types of school environment in seventh grade contribute differentially to the three types of school engagement eighth grade. Finally the authors found that students’ perceptions of school environment influenced their academic achievement directly and indirectly through the three types of school engagement specifically. Student’s perceptions of school characteristics in seventh grade influenced their school participation identification with school, and use of self-regulation strategies in eighth grade that occur therein and, in turn, influenced students’ academic achievement in eighth grade.

Rodriguez Diane et al. (2009) conducted a study on English language learners’ perceptions of school environment in North Carolina. The number of students who spoke languages other than English continued to grow in both rural and urban public schools in the United States. This study investigated the perceptions of 123 students (57 monolingual and 66 English language learners (ELLs) from a rural public elementary school in North Carolina with respect to school climate, curriculum and instruction, extracurricular activities, self-efficacy, and self-esteem. All of these indicators contributed to an overall perception of schools and affect learning experiences of monolingual students and ELLs. Results indicated that the perceptions of monolingual learners and ELLs in this particular elementary school were similar.

Cohen et al. (2009) showed that a positive and sustained school climate promotes students' academic achievement and healthy development. A positive school climate also promotes teacher retention, which itself enhances student success. Schools can use climate data to promote meaningful staff, family, and student engagement-and to enhance the social, emotional, ethical, civic, and intellectual skills and dispositions that contribute to success in school and in life. They discuss how to measure school climate and offer three ways on how educators can use school climate data to support education for the whole child.
Kinney (2009) analyzed that of building and maintaining a school culture that promotes safety and supports learning. So it should come as no surprise to experienced educators that school safety and positive school climate directly affect academic achievement. They discussed how principals can build an environment that is safe and secure. A list of indicators of an effective school climate is presented.

Pashiardis (2009) explored and analyzed secondary school students' (8th grade) perceptions about school climate in three areas, namely: the physical environment of the school, the social environment and the learning environment. The main findings concerning the three areas of school climate indicate that students are (generally) moderately satisfied with their school's climate. Specifically, the lowest mean was given to the area of social environment (3,12) on a five-point Likert type scale, the second highest (3,23) to the physical environment and the highest score (3,26) to the learning environment. Meanwhile, students in their answers indicated that they are not satisfied with specific items in the three areas of school climate which should be taken into account in future reform programs of Cyprus. These results provide an important source of information for educators and researchers who have the responsibility of creating educational policy and planning for the years to come for a better and a more modern educational system.

Shwu-Yong et al. (2009) conducted a study on the association of school environment to student teachers' satisfaction and teaching commitment in Taiwan. This study assesses student teachers' perceptions of secondary school environments, and then relates the perceptions to their satisfaction with school experiences and teaching commitment. The results show that considerable disparities between student teachers' perceptions of actual and preferred school environments and suggest certain directions for improvement. Student teachers' perceptions about their school environments, especially in the areas of professional interest and staff freedom, were positively associated with their satisfaction. Several school environmental aspects influenced the total years they planned to teach and their intention to teach at the placement schools.
Huy P. Phan (2008) conducted a study on achievement goals, the classroom environment, and reflective thinking: a conceptual framework. This research tested a structural model that included three theoretical frameworks: the classroom environment, achievement goals and reflective thinking practice were postulated to act as mediators between the classroom environment and academic performance. The sample included 298 (142 boys, 156 girls) year 12 students from four different secondary schools. Causal modeling procedures were used to test and evaluate the mediating and direct influences between the three theoretical frameworks motioned and academic performance. Path analysis indicated the predictive effects of different facets of the classroom learning environment on mastery and performance (approach, avoidance) goals also exerted direct effects on the four phases of reflection. The antecedents of academic performance included students’ involvement and performance-approach goals. A one way “ANOVA” showed no statistically significance between boys and girls. The evidence ascertained accentuates the important argument that psychosocial milieu of the classroom contributed to students’ achievement goal orientations and their engagement in reflective thinking practice.

Koth et al. (2008) studied that a positive school climate is an important component of successful and effective schools and thus is often an aim of school wide initiatives. Climate has traditionally been conceptualized as a school-level factor and is often assumed to be related to other school-level factors. The current study examines variation in perceptions of climate based on individual-, classroom-, and school-level factors to determine the influence of predictors at multiple levels. Multilevel analyses in hierarchical linear modeling indicate that individual-level factors (race and sex) accounted for the largest proportion of variance in perceptions of school climate. School-level factors (e.g., school size and faculty turnover) and several classroom-level factors (e.g., characteristics of the teacher, class size, and the concentration of students with behavior problems) were also significant predictors of perceptions of climate. These findings suggest that characteristics of the classroom environment are important to consider when aiming improving school climate.
**Stewart** (2008) examined the correlates of academic achievement is immense. In particular, scores of studies have examined individual- and family-level variables that influence student achievement. School-level characteristics into an investigation of the factors that influence adolescents' academic achievement. The results suggest that individual-level predictors, such as student effort, parent-child discussion, and associations with positive peers, play a substantial role in increasing students' achievement. The sense of school cohesion felt by students, teachers, and administrators, is important to successful student outcomes. He suggests that an ecological approach which encompasses individual-, family-, and school-level variables be considered when examining predictors of academic achievement. Policy and interventions aimed at improving academic achievement need to take into consideration the impact of individual-level and school structural factors on students and their ability to succeed.

**Brown and Medway** (2007) examined the roles of school climate, teacher expectations, and instructional practices in one elementary school in South Carolina (USA) that produced effective achievement outcomes with poor and minority students. The school was characterized by an emphasis on high student expectations, school staff cohesiveness, engaging instruction, high parent involvement, and multicultural instruction integrated with curriculum. The practices identified are consistent with literature on effective American schools; and the practices are key aspects of the sound instruction of poor and minority children. Teachers stated that teacher education programs did not prepare them to teach these students and that they had to learn this on the job.

**Chen** (2007) developed a school safety and student achievement model, incorporating the concepts of student background, school structure, school culture, school disorder, and student academic achievement. The study confirms that student background is associated with student behavior and student learning. School disorder affects student achievement negatively directly and indirectly mediated by student attendance. The study suggests that policy initiative could be implemented to improve school climate, therefore reduce school disorder and improve student achievement.
Halim, (2005) conducted a study of learning environment of secondary schools in relation to learner autonomy. The major objectives of the study were; 1. to study the learning environment as perceived by the secondary school students. 2. to study learner autonomy in secondary school students. 3. to compare learning environment and learner autonomy as seen in the secondary schools on the basis of board of affiliation. 4. to ascertain the relationship between learning environment of secondary schools and learner autonomy.

The researcher used the descriptive method of the comparative and correlation type. The researcher prepared the tool for gathering data from the students. The sample for the study consisted of students of IX and X standard from 15 secondary schools of Greater Mumbai. The sample was drawn at random. The tools were administered to 628 students. Its findings were as follows; 1. the CBSE students perceive their learning environment to be more conductive. The IGCSE were found to perceive their learning environment not as conductive as compared to the other three boards, i.e., SSC, ICSE and CBSE. 2. there was a significant differ learner autonomy of secondary school students of CBSE and other three boards, i.e., SSC, ICSE and IGCSE. 3. students belonging to all the four boards perceive that a conductive learning environment could definitely influence the autonomy in students learning in a positive and qualitative matter. 4. there was no significant difference in relationship between learning environment and learner autonomy in secondary schools students. On the other hand a significant difference in relationship exists between learning environment and learner autonomy in secondary school students of SSC and ICSE board.

Benson, Ella (2003) studied “The relationship between school climate and student achievement in low-income elementary schools”. The purpose of this investigation is to learn more about the relationship between school climate and student achievement especially in schools that serve children from low-income homes. More specifically this study is intended to (a) test the notion that a positive school climate is associated with student achievement among economically disadvantaged schools; (b)
determine the extent to which each of eight dimensions of school climate, predict student achievement and further explore the domain through a qualitative investigation of other identified in the educational Literature as being associated with achievement. Mean pass-rate percentages of third-graders were obtained from four elementary schools in southeastern Virginia. To control differences in district policy and configuration, these schools were all in the same school district and studied children in the same grades. Social class was controlled by selecting schools with similar proportions to students receiving free or reduced price lunches. Based on an analysis of third-grade SOL scores, the schools were classified as high achieving (one school), medium-achieving (two schools), or low-achieving (one school). The Charles F.Ketterin, limited school climate profile (CFK) was administered to 170 teacher’s staff, and administrator’s at all four schools. In addition, 17 of these participants answered a series of open-ended Questions about school climate. The findings are School climate and student achievement were positively (almost linearly) related (p<0.01). When ranked by achievement the climate means of the four schools fell in perfect rank-order. Moreover, significant (p.05) effects were found on all 8 CFK domain sub-scaled (trust, respect etc.).

**John Stephen Missouri** (2001) studied on the relationship between student socio-economic status, perception of school environment, academic achievement and school attendance. The objectives of the study were to study the relationship between student socio-economic status, perception of school environment, academic achievement and school attendance. Fifth grade students were selected. Sample school students from high and low SES schools in a Mid-Western City. 108 fifth grade students in 14 schools were selected. Significant findings were present with respect to perceptions of the school environment and academic achievement. Academic achievement would be higher in schools with high SES students.

**Solanki** (1992) conducted a study of the relationship between the educational management and the organizational climate of the secondary schools of Saurashtra region. The attempt was to study the relationship between the educational management and the organizational climate of the secondary schools of Saurashtra region. The
objectives were, 1. To examine the educational management with reference to the resource management system of the secondary schools of Saurashtra region. 2. To identify the organizational climate of the secondary schools of Saurashtra region. 3. To find out interrelationship between educational management and its factors and the organizational climate and its correlates. Using the stratified proportional random sampling technique, 165 schools were selected. A tool of 1335 teachers from the 165 sample schools had responded to the Educational Management Description Scale (EMDS) of Joshi and the Organizational Climate Description Questionnaire (OCDQ) of Halpin and Croft. Its findings were as follows; 1. The educational management of a school depended upon the resources of the school system. It was independent of sex, of students’ population, of organizational management and place of school but mostly depended upon the human, educational and physical dimensions of the resources. 2. The secondary schools differed among themselves in their organizational climate. The organizational climate of secondary schools appeared to be independent of the student population. 3. There was a relationship between the resource management system and the organizational climate of the schools. Highly resourceful schools were inclined towards the open range climate. Whereas the low-resourceful and very-low-resourceful schools were inclined towards the close range climate.

**Monita** (1986) conducted a study on an investigation of the relationship of pupil control ideology to teachers’ value orientation and perceptions of Organizational Climate in elementary schools. The instruments used in the study include the pupil control ideology form, the Revised Differential Value Inventory and three subjects of the Organizational Climate Description Questionnaire. The study was delimited to elementary schools which served grades one through six in school system in Alabama, Louisiana and Mississippi. A sample of 75 schools was randomly selected so as to provide approximately equal numbers of schools in each of five categories of population. The school served as the unit of analysis for the study. Significant zero-order correlation were found between pupil control ideology and traditionalism in Values (r=379 P=.01), pupil control ideology and population (r=.422 P=.01). A significant relationship was found between pupil control ideology and traditionalism in Values. No significant
relationship was found between openers in Organizational Climate and pupil control ideology. No significant interaction was found between value orientation and openers of climate as they related to pupil control ideology.

2.5 STUDIES ON PHYSICS ACHIEVEMENT

2.5.1 INDIAN STUDIES ON PHYSICS ACHIEVEMENT

Indian studies related to achievement in science in general and achievement in physics in particular along with other related variables are presented in this section.

Nityagopal Mondal and Birbal Saha (2013) studied on achievement difference in science at secondary level in Darjeeling District: A Comparative Study. The study was conducted to provide some information and comparison about the achievement in science subjects at secondary level in Darjeeling District, West Bengal. Data were collected from 140 students from four higher secondary schools in Darjeeling District, randomly. The results revealed that (1) male and female students differ significantly with regard to achievement in science subjects at secondary level, (2) urban male and rural male students differ significantly in achievement in science at secondary stages and (3) urban female and rural female students differ significantly in achievement in science at secondary level.

Ashokkumar B. Surapur (2012) conducted a study on the impact of government school student’s interest in science, study habits and school adjustment on academic achievement in science. The purpose of the study was to analyze independent and combined effects of variables viz., Interest in science (higher and lower), Study habits (good and poor) and School Adjustment (high and low) on Academic achievement in Science. The sample of the study includes 300 students selected randomly from IXth Standard. The study revealed that (i) the government school students with higher interest in science have more influence on academic achievement in science than the government school students with lower interest in science, (ii) the government school students with higher interest in science and high school adjustment have more influence on academic achievement in science than the government school students with higher interest in
science and low school adjustment and (iii) the government school students with good study habits and low school adjustment have more influence on academic achievement in science than the government school students with poor study habits and low school adjustment.

Nataraj, P.N., and Manjula, G. (2012) conducted a study on scientific aptitude of high school students in relation to their achievement in science. In this study, the researchers have attempted to study the scientific aptitude of high school students in relation to their achievement in science. The investigation was carried out on 650, 9th standard students. The findings of the study on scientific aptitude and achievement in science shows that male and female, Hindu, Christian and Muslim students do not differ significantly, While scientific aptitude and achievement in science between rural and urban high school students differ significantly. Also significant correlation is found between achievement in science and scientific aptitude of high school students.

Rajendran, S. (2012) conducted a study on the relationship between scientific attitude and achievement in science of X standard students in Coimbatore District. The major objectives of the study were to find out the relationship between scientific attitude and achievement in science of X standard students studying in Coimbatore District. The sample of the study includes 1394 students studying in X standard in Coimbatore District. The sample has been selected by applying stratified random sampling technique. The major findings were: (1) there is a positive relationship between scientific attitude and achievement in science of X standard students, (2) girls are better than boys of X standard in their scientific attitude and achievement in science and (3) the X standard students studying in government, aided, municipal and corporation schools differ in their scientific attitude and achievement in science.

Kalaivani, S., and Babu, R. (2011) conducted a study on higher secondary students achievement in physics in relation to their study habits. The objectives of the study were: (1) to find out the higher secondary students study habits; (2) to find out the higher secondary school students achievement in physics; (3) to find out whether there is
significant difference between male and female, rural and urban, employed and unemployed parents students study habits; (4) to find out whether there is significant difference between male and female, rural and urban, employed and unemployed parents students achievement in physics; (5) to find out whether there is significant relationship between study habits and achievement in physics. The investigators have selected a sample of 565 higher secondary school students from six schools from Cuddalore District. The sample has been selected by applying simple random technique. The data has been subjected to statistical treatment for analysis and interpretation with the computer by using SPSS package. The major findings were: (1) there is a significant relationship between study habits and achievement in physics, (2) there is a significant difference between rural and urban students, government and private higher secondary school students in respect of their achievement in physics, (3) there is no significant difference between male and female students in respect of their achievement in physics, (4) there is significant difference between rural and urban students in respect of their study habits and (5) there is no significant difference between male and female, government and private higher secondary school students in respect of their study habits.

**Murugan, R.** (2010) conducted a study on the effect of home environment on achievement in science of VIII standard students in Mettur Taluk of Tamil Nadu. The objectives of the study were: (1) to find out the difference in the home environment of the students based on gender and location, (2) to compare in the students achievement in science based on gender and location, (3) to find out the effect of home environment on achievement in science of the VIII standard students. Cluster random sampling of 160 students is used. The collected data were analyzed by using statistical technique like mean, standard deviation, frequency, range, t-test and correlation with the help of SPSS software. The major findings were: (1) the achievement of students in science is dependent on their home environment. The students of high home environment have achieved higher than that of the students with medium and low home environment. The students having medium home environment background have achieved higher than low home environment background students. (2) there is a significant difference between boys and girls achievement in science. The girls have performed better than boys. (3) the
urban area students have performed better than the rural areas students in science achievement. So there is a significant difference in the achievement of students in urban and rural areas.

Kalaivani, S et. al., (2010) conducted a correlation study of higher secondary students’ achievement in physics and their self-concept. The objectives of the study were: (1) to find out the correlation difference between achievement in physics and self-concept of higher secondary students based on the type of school, parents occupation. The investigators have selected a sample of 565 higher secondary school students from 11 schools from Cuddalore District. The sample has been selected by applying simple random technique. The data has been subjected to statistical treatment for analysis and interpretation with the computer by using SPSS package. The major findings were: (1) Higher secondary students significantly differ in their achievement in physics on the basis of type of school, (2) Higher secondary students do not significantly differ in their achievement in physics on the basis of parents occupation, (3) Higher secondary students significantly differ in their self-concept in physics on the basis of type of school and (4) Higher secondary students do not significantly differ in their self-concept in physics on the basis of parent’s occupation.

Usha and Rekha et.al (2009) surveyed, “Emotional Competence and Mental Health as predictors of Academic Achievement”. The study aimed to find out the relationship between emotional competence and achievement in physics for total sample and sub-samples; to find out the relationship between mental health and achievement in physics for total sample and sub-samples; to find out the correlation of achievement in physics for total sample and sub-samples; to find out the correlation of achievement in physics with emotional competence and mental health. The data were collected from the sample of 530 secondary school students from the schools of Thirssur and Erankulam districts of Kerala. Scale of Emotional Competence (2006) by Usha and Rekha, Mental Health Status Scale (1999) by Usha, Anil and Remmya, Achievement Physics (2004) by Usha and Suchitra were the tools. The findings were: significant gender difference does not exist in emotional competence, mental health and achievement in physics of rural and
urban pupils, there exists low but slight positive correlation between emotional competence and achievement physics for the total sample and sub-samples, multiple regression analysis showed that there exists a linear relationship between emotional competence and achievement in physics.

**Singaravelu, S.** (2009) studied the “Test Anxiety and Academic Achievement in mathematics of high school students”. The study aimed to find out the significant relationship between the test anxiety and academic achievement in mathematics of high school students, to find out the significant relationship between the test anxiety and academic achievement in mathematics of high school students with respect to gender and locality, to find out the significant relationship between the test anxiety and academic achievement in mathematics of (a) Boys and girls, (b) Urban and rural school students, to compare the academic achievement in mathematics of students with different levels of test anxiety. The sample consists of 300 high school students, selected using cluster sampling technique from Puducherry region. Test Anxiety Scale for children (TASC) by Sarason and Average half-yearly marks from school office register are used to assess test anxiety and academic achievement respectively. Findings revealed that higher the test anxiety, lower was the academic achievement in mathematics. Also students with average level of test anxiety achieved more than the students with high and low levels of test anxiety.

**Vasugi, K., and Padamakalavathy, K.** (2009) conducted a study on scientific aptitude and achievement in science among high school students. The study was conducted (i) to study about scientific aptitude among high school students of Dindigul district. (ii) to determine the significant differences between scientific aptitude with variables like sex, locale, medium of instruction, type of school, educational qualification of parents of the students and their income. (iii) to find out the relationship between the scientific aptitude and achievement in science among high school students of Dindigul district. The normative survey method was used to find out scientific aptitude and achievement in science among high school students of Dindigul district. The sample used for this study was randomly selected 200 high school students from Dindigul district.
Major findings of the study were (1) the scientific aptitude of high school students in Dindigul district is high. (2) the high school boys and girls significantly differ in their scientific aptitude. (3) the urban and rural high school students differ significantly in their scientific aptitude. (4) the English and Tamil medium students differ significantly in their scientific aptitude. (5) the high school students from matriculation and government aided school differ significantly in their scientific aptitude. (6) the high school students with educated parents and illiterate parents differ significantly in their scientific aptitude. (7) the students belonging to sufficient income status and deficit income status differ significantly in their scientific aptitude. (8) there is a significant positive high relationship between scientific aptitude and achievement in science.

**Jeba and Annaraja** (2008) conducted a study to find out the relationship between multiple intelligence and achievement in physics among high school students. The major objective of the study was to find the relationship between multiple intelligence and achievement in physics. 250 samples of high school students were selected from Kanyakumari district. Mean, correlation and ANOVA were the statistics used to analyze the data. Major findings of the study were: (i) there was no significant difference in multiple intelligence and achievement by their gender, type of school and locality and (ii) there was no significant relationship between multiple intelligence and achievement.

**Nidhi Srivatsava** (2007) conducted “A study of emotional intelligence in relation to achievement in environmental studies”. To, find out relationship between emotional intelligence and achievement in environmental studies, to compare the emotional intelligence of high and low achievers in environmental studies. The correlation survey and casual-comparative methods of research were used. 77 students of ninth class from an institution of Allahabad have been taken as a sample. Mean, SD, ‘t’ test and correlation were calculated. There is a significant positive correlation between emotional intelligence and academic achievement in environmental studies. There is a significant positive correlation between emotional intelligence and academic achievement in environmental studies. There is a significant difference in emotional intelligence of high and low
achievers in environmental studies. As compared to high achievers in environmental studies, low achievers in this subject exhibit less emotional intelligence. Emotionally intelligent students may be more emotionally stable and sensitive to their environmental issues than their less emotionally intelligent counterparts.

Raheem, A. (2006) conducted a study on certain cognitive and no cognitive predictors of attitude towards science and science achievement among Muslim and non-Muslim adolescents. The study was conducted to identify the significant predictors of attitude towards science and science achievement and their extent of predictability for the total sample, Muslim and non-Muslim sample, male and female sample, Muslim male, Muslim female, non-Muslim male, non-Muslim female sample. The nature of design of the study is said to be exploratory one. Nineteen schools, selected by stratified random sampling of Aligarh District made its population. The sample constitutes eight hundred four students comprising one hundred ninety-nine Muslim males, one hundred ninety Muslim female, two hundred ten non-Muslim males and two hundred five non-Muslim female. The major findings were: (1) Intelligence, SES and creativity are found to be the significant predictors of attitude towards science for the total sample and have the predictability strength of 18.3 per cent. (2) Intelligence, SES and creativity for the Muslims and intelligence and SES for the non-Muslims are found to be the significant predictors of attitude towards science.

Shivakumar, P. (2006) conducted a study on the influence of home environment upon the academic achievement in science of VII standard students in Chamarajanagar Taluk, Karnataka. The objectives of the study were: (1) to find out the influence of home environment on the achievement of students in science, (2) to know whether gender has any influence on the achievement of students in science, (3) to compare the achievement of students in science studying in government and private unaided schools, (4) to find out the influence of locality on achievement of students in science. Cluster random sampling of 160 students is used. The collected data was analyzed using statistical technique like mean, standard deviation, frequency, range, t-test and chi-square test with the help of SPSS software. The major findings were: (1) the achievement of students in science is
dependent on their home environment. The students of high home environment have achieved higher than that of the students with medium and low home environment. The students having medium home environment background have achieved higher than low home environment background students. (2) there is a significant difference between boys and girls achievement in science. The girls have performed better than boys. (3) there is no significant difference in the achievement of students in science government and private unaided schools. (4) the urban area students have performed better than the rural areas students in achievement in science. So there is a significant difference in the achievement of students in urban and rural areas. (5) the achievement of students in science is dependent of their parents’ educational qualification. (6) the achievement of students in science is dependent on their parent’s occupation.

James, A., and Marice, P. V. (2004) conducted a study on achievement in science related to scientific aptitude among XI\textsuperscript{th} standard students in Tamil Nadu. The major objectives of the study were: (1) to explore the relationship among the variables namely achievement in science, scientific aptitude and scientific attitude, (2) to investigate the association between (i) achievement in science, (ii) scientific aptitude, (iii) scientific attitude and some selected variables. The sample constituted 470 students of standard XI who had opted for science group drawn from 10 schools of Coimbatore District of Tamil Nadu. The major findings were: (1) there is positive relationship between achievement in science and scientific aptitude whereas achievement in science and scientific attitude are not related. (2) there is significant gender difference in science achievement, favouring girls. However, boys and girls are on par in scientific aptitude and scientific attitude. (3) students hailing from rural and urban areas have similar scientific attitude and same type of academic achievement in science. But they differ in their scientific aptitude. (4) students from matriculation and state board schools have same type of achievement score in science but they differ in their scientific aptitude and scientific attitude, favouring students from matriculation schools. (5) students from different types of school (gender wise) differ in their achievement in science favouring girl’s schools. But they are found on par in their scientific aptitude and scientific attitude. (6) there is significant association between gender and science achievement, and gender
and scientific aptitude whereas no significant association is observed between achievement in science and scientific aptitude. (7) significant association is observed between residential origin (rural and urban) and scientific aptitude. But students irrespective of their residential origin have similar scientific aptitude and same type of achievement in science. (8) School type (syllabus wise) is found to be significantly associated with scientific aptitude and scientific attitude. (9) Achievement in science and scientific attitude are found to be significantly associated with school type (gender wise) whereas no significant association is found between scientific aptitude and school type.

Amaladoss Xavier, S.S., and Amalraj, A. (2003) conducted a study on Achievement of Higher Secondary Students in Chemistry. The objectives of the study were to study the achievement of Higher Secondary students in chemistry and its branches in terms of personal factors (gender); educational factors (medium of study); institutional factors (location of the school) and other background variables. The Higher Secondary final year students of Kanyakumari Revenue District have been chosen as the population 900 students were chosen using the stratified random sampling techniques. The major findings of the study were: (1) the level of achievement of student in chemistry is average. (2) the achievement of student in inorganic chemistry is higher than in other branches of chemistry.

Rajeswari (2001) conducted a study to know the effect of reasoning ability and scientific attitude on achievement of higher secondary students in physics. The study focuses on the correlation between reasoning ability and achievement of the children with regard to the background variables. It also focuses on the correlation between scientific attitude and achievement of the children with regard to the background variables. In this study survey method was adopted. A sample of 300 students was selected randomly. The major findings were that there was no correlation between reasoning ability and achievement with regard to boys, girls, boy’s school, girl’s school, co-education school, government school, aided school, unaided school and students from rural area. But there was correlation between reasoning ability and achievement with regard to students from urban area. More over there is no correlation between scientific attitude and achievement
with regard to boys, girls, boy’s school, girl’s school, co-education school, government school, aided school, unaided school and students from rural area. But there is correlation between scientific attitude and achievement with regard to students studying in aided school and students from urban area.

**Usha et.al. (2000)** focused on “The effect of co-operative learning on achievement in chemistry, perception towards teaching learning and social relations”. Comparing the effectiveness of co-operative learning method with conventional method in learning selected units in chemistry at the higher secondary level formed the major hypothesis of the study. Students enrolled in XII std. constituted the sample. Printed text booklet, printed programmed text and achievement tests were the tools employed in the study and ‘t’ test was the statistical measure used for data analysis. The study concluded that cooperative learning approach in general makes the children interested in learning chemistry and it is more useful to decrease waste and stagnation and the number of drop out of the academic year and it also maximizes the students.

**Ahuja (1994)** studied, “The effects of a cooperative learning instructional strategy on the academic achievement attitudes toward science class and process skills of middle school science students”. Cooperative learning experience has been shown to have positive effects on the academic achievement, self-esteem, inter-racial and cross sex relations attitudes, and motivation of science students. The purpose of this study was to determine whether the use of a cooperative learning instructional strategy would influence the academic achievement, attitudes toward science class, and process skills of middle school science students. A secondary purpose was to determine whether these outcomes were related to the gender of the student and time of day the class was held. The sample consisted of five seventh grade classes (116 students), two of these classes (48 students) were randomly assigned to the control group, which randomly assigned to the experimental group which received traditional instruction, and three classes (68 students), were randomly assigned to the experimental group which was exposed to cooperative learning experiences. Findings from the analysis of covariance on the post-tests scores indicated that the use of a cooperative learning instructional strategy resulted
in greater academic achievement and better attitudes toward science class of these students. The process skills were not influenced by the instructional strategy. Students were purposefully selected on basis of their responses on the attitudes checklist for interviews. Responses from the interviews corroborated the findings that cooperative learning experiences is looked upon more favorably by middle school science students, who find that it helps improve their perceptions of science, makes science learning more fun, and improve their learning.

**Moosa (1994)** studied about “Concept Mapping and Academic Achievement of Pupils of std XI in Chemistry in the Higher Secondary School”. Pre-post test design was adopted. The sample consists of 10 boys, 10 girls and 30 co-education students. Achievement test and ideal concept maps were the tools. The data was analyzed through Mean and Standard Deviation. The findings revealed the impact of concept maps on students in XI standard were able to learn the selected concept mapping and Learning through concept mapping increased the level of achievement of students in chemistry.

### 2.5.2 INTERNATIONAL STUDIES ON ACHIEVEMENT IN PHYSICS

International studies related to achievement in science in general and achievement in physics in particular along with other related variables is included in this section.

**Nik Zarini Nik Kar (2012)** conducted an experimental study on the effect of inquiry discovery approach towards student achievement in the subject of physics. The purpose of this study was to examine the effects of inquiry-discovery approach in teaching and learning of physics as compared to the conventional approach. The effects of inquiry-discovery approaches are focused on students' achievement and attitude towards physics as a subject and also the learning of physics. The quantitative research using quasi experimental design was employed to examine the effectiveness of the inquiry-discovery approaches. A total number of 81 science stream students were involved as the subject of this study. Approximately, 40 students of the treatment group learned physics through inquiry-discovery approach while the other 41 students of control group received the lesson through the conventional approach. The findings
obviously show that there is a significant difference in the achievement of students as well as their attitude towards the physics lesson in both approaches. This study has proven that inquiry-discovery approach is improving the students' performance as well as their understanding of the physics subject. This approach has also stimulated the positive attitude of students toward physics subject.

Harkirat S. Dhindsa and Shahrizal-Emran (2011) conducted a study on using interactive whiteboard technology-rich constructivist learning environment to minimize gender differences in physics achievement. The aim of this study was to evaluate if a constructivist teaching approach, enriched with interactive whiteboard technology could empower males to minimize gender differences in achievement in physics. Two groups of students were taught for six weeks: one group using the constructivist teaching approach enriched with interactive whiteboard technology and the other group using a traditional teaching approach. The results of the study demonstrated statistically significant gender differences in pre-test mean achievement scores of both the groups. There were statistically significant gender differences in post-test mean achievement scores for group taught traditionally, however, mean achievement scores of male and female students taught using constructivist approach were statistically non-significantly different. It is believed that this technique has potential to minimize gender difference in physics achievement.

Jennifer Champion (2011) conducted a study on the pedagogic effects of co-operative learning assessment in the physics I classroom. The purpose of this quasi-experimental study was to examine the impact of co-operative learning assessment on student achievement. This study aimed to determine the relationship between teacher-assigned/group-elected laboratory positions (independent variable) and academic achievement (dependent variable) while using the cards on the table approach of co-operative learning assessment. Participants consisted of 2 classes of Physics I students enrolled in a small rural school system. Alternative assessment practices such as the cards on the table approach of co-operative learning assessment were examined and discussed. Results of ANOVA analyses indicated no significance difference in the adjusted scores
between teacher-assigned versus group-elected laboratory positions within structured laboratory groups on the academic achievement of physics I students as measured by a standardized pretest/post-test while using the co-operative learning assessment. Conducting paired samples t-tests revealed the group-assigned students improved significantly from pre-test to post-test while the teacher-assigned students had no significant improvements.

Cengiz Tuysuz (2010) studied the effect of the virtual laboratory on students' achievement and attitude in physics. In this study, a virtual laboratory related to "Separation of Matter" unit for 9th grade students was prepared and its effects on students' achievements and attitudes were investigated. For this aim 16 virtual experiments prepared by using flash program and used in the experimental group. Result of this study showed that virtual laboratory applications made positive effects on students' achievements and attitudes when compared to traditional teaching methods.

Cansel Kadioglu and Esen Kadioglu (2008) investigated the motivational factors contributing to Turkish high school students' achievement in gases and chemical reactions. This study aimed to investigate the contribution of motivational factors to 10th grade students' achievement in gases and chemical reactions in chemistry. Three hundred fifty nine 10th grade students participated in the study. Multiple Regression Correlation analysis indicated that the constructs of intrinsic goal orientation, self-efficacy for learning and performance, and test anxiety each made a statistically significant contribution to the students' achievement.

Francis A. Adesoji and Segun M. Olatunbosun (2008) carried out a study about student, teacher and school environment factors determinants of achievement in senior secondary school physics in Oyo State, Nigeria. The study constructed and tested an eight-variable model for providing a causal explanation of achievement of secondary school students in physics in terms of student variables - attitude to learning physics, background knowledge in integrated Science, teacher variables - attitude to physics teaching, attendance at physics workshop and school environment related variables-class
size, laboratory adequacy and school location. The study adopted an ex-post facto research type; the population was made up of 621 senior secondary III physics students and 27 Senior Secondary III physics teachers in Oyo State, Nigeria. The results revealed that 7.20% of the total effect on achievement in physics was accounted for by all the seven predictor variables when taken together. It was also revealed that only four variables – school location (X1), laboratory adequacy (X3), teachers' attitude to physics teaching (X5) and teachers' attendance at physics workshop (X4) had direct causal influence and also made significant contributions to the prediction of achievement in physics (X8) (the criterion variable).

Esen Uzuntiryaki (2007) conducted a study on learning styles and high school students' Physics Achievement. The aim of the present study was to investigate the effect of students' learning styles on their physics achievement, and whether matching between teaching and learning styles also affects students' physics achievement. Two hundred and sixty-five tenth-grade students enrolled in a physics course and seven physics teachers participated in the study. Results showed that there was a statistically significant difference among students with different learning styles with respect to physics achievement. Students in facilitator/personal model/expert teaching styles and delegator/facilitator/expert teaching styles had better understanding of physics concepts, but there was no statistically significant effect of matching between students' learning styles and teachers' teaching styles on students' physics achievement.

Marcel Frailich, et.al. (2007) conducted a study on the influence of web-based physics learning on students' perceptions, attitudes, and achievements. The goal of this study was to investigate whether integrating a website into physics teaching influences 10th-grade students' perceptions of the classroom learning environment, their attitudes regarding the relevance of physics, and their understanding of the concept of chemical bonding. Two groups participated in this study: an experimental group and a comparison group. The main study was conducted during the academic year 2005. The teachers in the experimental group were asked to implement four relevant activities from the website that was developed, all dealing with the concept of chemical bonding. Quantitative tools
of the study included. A Physics Classroom Web-Based Learning Environment Inventory to assess students' perceptions regarding the relevance of physics to their life and attitude towards physics studies, a feedback questionnaire that examined the students' response after performing the website activities, and an achievement test that assessed their knowledge and understanding of the concept of chemical bonding. It was found that the experimental group outperformed the comparison group significantly in most of the research categories. This led to conclude that the web-based learning environment has potential to enhance the comprehension of physics concepts, students' attitudes and interests and to increase students' awareness regarding the relevant aspects of physics to daily life.

Patricia W.Wambugu and Johnson M. Changeiywo (2007) studied the effects of Mastery Approach (MLA) on students’ achievement in Physics. The study was Quasi-experimental and Solomon Four Non-equivalent Control Group Design was used. The target population comprised of secondary school students in Kieni East Division of Nyeri Dt. The accessible population was Form Two students in district co-educational schools in the division. Purposive sampling was used to obtain a sample of four co-educational secondary schools. Each school provided one Form Two classes for the study hence a total of 162 students was involved. The students were taught the same Physics topic of Equilibrium and Centre of Gravity. In the experimental groups MLA teaching method was used while the Regular Teaching Method (RTM) was used in the control groups. The experimental groups were exposed to MLA for a period of three weeks. The researchers trained teachers in the experimental groups on the technique of MLA before the treatment. Pretest was administered before treatment and a post-test after three weeks treatment. The instrument used in the study was Physics Achievement Test (PAT) to measure students’ achievement. The instrument was pilot tested to ascertain the reliability. The reliability coefficient α was 0.76. Experts ascertained their validity before being used for data collection. Data was analysed using t-test, ANOVA and ANCOVA. Hypotheses were accepted or rejected at significant level of 0.05. The results of the study show that MLA teaching method resulted in higher achievement but gender had no significant influence on their achievement. The researchers concludes that MLA is an
effective teaching method, which physics teachers should be encouraged to use and should be implemented in all teacher education programmes in Kenya.

Samuel, W. Wachanga and John Gowland Mwangi (2004) conducted an experimental study on the effects of the co-operative class experiment teaching method on secondary school students' physics achievement in Kenya's Nakuru District. This study sought to examine how the co-operative class experiment teaching methods affect students' achievement. Using a non-equivalent control, group design with 521 randomly selected secondary school students, the study found that co-operative class experiment method facilitated students' physics learning, more than regular methods. Gender did not affect achievement. Neither did school type significantly affect girls' achievement when co-operative class experiment method was used but it significantly affected boys' achievement with boys in boys' schools attaining higher scores.

Omer Delialioglu (1999) investigated the contribution of mathematical skills and spatial ability to achievement in secondary school physics. Sixty-eight 10th grade students from a high school in Ankara were given mathematical skill test (MST), spatial ability tests (SAT) and physics achievement test (PAT). Correlation analysis showed that the correlation coefficient for mathematical skills and physics achievement was 0.46 (p<0.05), and for spatial ability and physics achievement was 0.45 (p<0.05). To see the combined contribution of mathematics and spatial ability to physics achievement, multiple regression analysis was applied. The results showed that the contribution of the two predictor variables (mathematical skills and spatial ability) accounted for almost 31 % of the variance in the physics achievement test scores.

2.6 SYNTHESIS OF THE REVIEWS

By analyzing and reviewing the previously conducted research studies on three variables Learning Styles, School Climate and Academic Achievement all the three variables have had consistent level of relationship to each other.
By reviewing the Learning Styles were done on covering the wide range of styles like joyful learning, cooperative learning, learning through memorizing, active learning, theoretical learning, concept mapping, collaborative learning, web based learning, active problem solving, individual differences in learning styles, attitudinal learning, self-learning group inspiration, Visual, Auditory and Kinesthetic (VAK) learning styles were used. Some of the studies investigated the relations learning styles and school climate and learning styles on the achievement of the students. A few of the studies attempted to find the problems and functioning in implementing new styles and strategies. In reviewing various studies the paradigm shift from styles to strategies could be noticed. The tools covers weekly test, pre test and post test design, exit interviews, observations schedule, an attitudinal survey, learning styles inventory, Likert scale survey and the tools designed exclusively for different learning styles.

Regarding tools, self reporting questionnaires, observations, performance based on interviews, opinionnaires were used for the studies based on Learning Styles. Among the variety of tools, one of the standardized tools widely used is (VAK) learning styles inventory. It was exposed that, (i) there exists positive relationship between the independent variable academic achievement, (ii) another independent variable School Climate enhances and strengthens the academic achievement in the majority of the studies.

As far as the methods concern, survey method was adopted in the most of the studies. Few studies followed experimental method and in the few studies quasi experimental design was used. In the experimental studies through some designed strategies it was used to improve the school climate. In learning styles the experimental method is used to enhance the selected learning styles and to see the effect of it on achieving academically and synergizing some concepts.
The statistics applied in the above studies are qualitative analysis ‘test, ‘F’ test, ANOVA, MANOVA, Chi-square analysis, factorial design, correlation matrix, Pearson’s product moment correlation, multiple regression analysis, analysis of variance and Post hoc procedures and Pearson’s product moment correlation.

By reviewed studies the school climate becomes significant concept in the field of education. In the inception it was being used in the fields of administration also. The studies on school climate were associated with the variable such as, achievement motivation, academic achievement, academic anxiety, learning styles, teacher morale, teaching competency, academic performance, socio economic status, prevalence of moral values, student characteristics, pupil growth, creativity of children, student morale, student values, learning behavior, teacher profile, cognitive development, teacher commitment, reflective thinking, educational management, learner autonomy, teacher expectations and instructional practices.

By reviewing the studies on academic achievement, it was made known that the number of researches revealed that there were positive relationship exists between the achievements of students in various subjects by the intervention of many other variables. Almost all the studies attempted to investigate the influences of various selected variables on the achievement in different academic subjects like science, chemistry and physics. A few of the studies attempted to test the academic achievement of students of consecutive years. In several of the foreign studies on academic achievement multiple variables such as students study habits, school adjustment, student interest in science, scientific attitude, scientific aptitude, home environment, school environment, self concept, emotional competence, mental health, multiple intelligence, concept mapping, co-operative learning, emotional intelligence, test anxiety, effect of reasoning ability, co-operative learning, instructional strategy, inquiry discovery method, learning environment, pedagogic effects, learning styles, web based physics learning etc. were tested upon and they were found to be the significant predictors of academic achievement.
Wider range of reviews consistently revealed that there were impacts identified on the academic achievements of students due to many empirical interventions in many researches. Also there were influences found due to emotional, social and personal factors of samples when put into test through survey method on achievement as well as personal well beings in some of the students.

2.7 IDENTIFICATION OF THE RESEARCH CAP

The reviewed research studies were both on empirical and descriptive in nature. Most of them attempted to study the nature and to test the relations of the selected variables on the academic achievement and the school climate. The relation and the impact of learning styles on academic achievement were very effective and found there existed positive correlation. The researcher attempted to examine the students’ school climate and their preference of learning styles to see the relations of those independent variables and how it works upon their academic achievement. As far as the researcher knowledge goes, no study has been conducted to investigate the relations of the School climate and the perceptual Learning styles (Visual, Auditory, Kinesthetic) associating together to study the achievement especially in physics achievement in higher secondary schools students in India. Hence, the present study has been taken by the researcher to study the relations of Learning Styles, School Climate and Academic Achievement in Physics among higher secondary school students.

2.8 CONCLUSION

This chapter contained studies on the selected variables namely Learning Styles, School Climate and Academic Achievement. The reviewed studies were of both from Indian as well as Foreign. The review of literature in this chapter is twofold one thing is to view the existing literature on the selected variables and another thing is to critically view them to strengthen the present research. While synthesizing them, they immensely helped the researcher to find the research gap and to state the persisting problem and design the present study.