CHAPTER II
REVIEW OF RELATED LITERATURE
CHAPTER- 2

REVIEW OF RELATED LITERATURE

“Practically all human knowledge can be found in books and libraries. Unlike other animals that must start with each generation. Man builds upon the accumulated and recorded knowledge of the past. ”

J.W .Best (1978)

Research is an important aspect for progress in every sphere of life. The review of related studies helps us to know what others have tried to find out and what problems remain to be solved. It helps the researchers to eliminate the duplication of what has already been done and it provides useful hypotheses and important suggestion for further investigation. The study of related literature in research is of immense importance because it stimulates and encourages the investigator to develop into various aspects of the problem. It also helps in paying the way for under no gap standing the potentialities of the problem in hand. A review of related literature is an integral part of theses or dissertations. It may also be a required part of proposals. The main purpose of a review of related literature is to analyze scientific works by other researchers that you used for investigation critically.

Review of related literature may serve to avoid unnecessary duplication and may help to make progress towards the solution of new problems.

According to Best (1963), familiarity with the literature in any problem area helps the students discover what is already known, what others have attempted to find out, what methods have been promising and disappointing and what problems remain to be solved.

A description of the related literature with regard to the independent variables of Modular and Multimedia Instructional Strategies, Cognitive Styles, Achievement Motivation and their relation with the dependent variable of Achievement of students has been given.
2.1 Modular Instructional Strategy and Achievement

Donald and William (1973) conducted a study to investigate the effectiveness of a series of self-instructional modules (SIMS) for training secondary level social studies teacher trainees to develop and ask higher level questions. The study showed that self-instructional module is more superior to conventional methods for developing concepts and skills.

Puttorak (1975) worked on the development and field testing of a lab module for instruction in Vascular Plant Taxonomy. A self-paced lab module in Vascular Plant Taxonomy was developed to aid undergraduate biology students in understanding both traditional and contemporary activities of the plant taxonomist. Results showed that the general biology students preferred the modular method of instruction than the traditional type.

Heller and Mary (1976) conducted a study to compare the effectiveness of instruction using a "Learning Module Approach" with that of instruction using a "Traditional Lecture Discussion" in an undergraduate course entitled "Psychology of Exceptional Child". The results of the study showed that module programme results in significant gain for students.

Sahajahan (1980) performed an experimental study of teaching of science in standards-VI and VII through modules and found that the modular way of learning was more effective than the conventional method. Majority of students possessed a favourable attitude towards modular instruction. The reaction of teachers to modular approach of instruction was also favourable. The achievement of students through instructional modules has a positive correlation with their attitude towards modular way of learning.

Kaur (1981) conducted a study with the objectives to prepare self-instructional audio-cassettes for developing the skills of probing, questioning, explaining and illustrating with examples among student-teachers and found that experimental group made continuous progress component-wise and as a whole in all the four skills of student-teacher. The self-instructional audio-cassettes were effective for developing different teaching skills. Immediate, pinpointed and self-feedback through audio-cassettes was an effective way of improving the performance of student-teachers in the use of different teaching skills.
Passi and Pal (1982) undertook a study to prepare a multimedia instructional module for developing the skill of observing classroom behavior; self-instructional materials (SIM) were developed through trials of 'draft-review-modification' cycles. Reviews were gained through expert judgment and students' reaction. It was found that experimental group using SIM obtained significantly higher mean scores on the criterion tests. Students' reaction towards SIM was also positive.

Hopper (1982) designed and developed modules for teaching certain units in Biology to standard XI students and found that all the three structured modular approaches of teaching, viz., self-learning, peer group learning and peer group learning with teacher intervention, were effective in terms of mean gain in cognitive achievement. However, the self-learning approach was more effective than the other two modular approaches. The modular approach of teaching Biology led to a significant increase in the achievement of the students.

Sharma (1982) compared the effectiveness of three modules for civics teaching with the traditional teaching method in terms of achievement of student-teachers on criterion test. He found that the mean achievement scores of the experimental group of student-teachers were significantly higher than that of control group.

Khanna (1983) prepared need based and relevant modular reading material on the topic "our food" especially for girl dropouts living in Delhi slums. The girl dropouts who were fluent readers took on an average 75 minutes for reading the module and another 35 minutes, for attempting the tests. Thus modular reading material was found to be significant in improving the reading competency and cumulative performance. On the affective side, it was found that after exposure to the module, the average score of the girl dropouts on the opinionative increased from 7.5 to 13.5 indicating a positive shift. The results of the follow-up carried out with 12 girl dropouts indicated that the module was remembered by all the 12 girl dropouts indicating a positive and significant relationship with retention.
Kathuria (1984) experimented four approaches - teacher-led approach, self-instructional approach, peer-group discussion approach and mass media approach of teaching population education to classes IX and X on knowledge, attitudes and beliefs of the students about population explosion in India. He observed that peer-group discussion approach and mass media approach were equally successful and were found to be better than the self learning approach and teacher-led approach. With regard to rural and urban settings of the schools and the students, it was found that self-learning and peer group approaches were more suitable for rural settings and the mass media approach for urban settings. No significant difference was found as regard to effect of approaches on achievements of students.

Prabhune (1984) developed instructional material for the use of self-learning and discussion method of teaching measuring higher level intellectual skills and abilities on the development of learners' scientific attitude and problem-solving skills and found self-instructional teaching device significantly effective.

Rae (1985) conducted a study on "The Development and Evaluation of a Self Instruction Learning Module" for associates of science degree nursing students. The purpose of the study was to determine the effects of self-instruction module and the study employed a non-equivalent control group design with random assignment of intact groups. The sample for this study consisted of 78 associate degree nursing students. Submitting the scores to an analysis of covariance at the 0.05 significant level revealed that the experimental group performed better on the post-cognitive examination than those taught the exchange system for real planning in a regular medical-surgical nursing class.

Dhamija (1985) compared the effectiveness of three approaches of Instructions-modular approach, radio-vision and conventional approach on achievement, retention, students' involvement and self-confidence of students in social studies as well as in three different disciplines of social studies, namely geography, civics and history and observed that the students obtained highest Knowledge achievement scores in geography when taught through
radio-vision approach; the achievement was highest in civics when taught through modular approach and highest knowledge achievement score was obtained in history when taught through the conventional approach. The involvement of students in classroom was maximum when they were taught through the radio-vision approach and self-confidence among the students increased the most when they were taught through the modular approach.

Yadav (1989) developed twelve self-contained and self-sufficient instructional modules on different aspects of the methodology of educational research with specific objectives to know achievement and terminal behaviour. The preparation of modules followed the same chain of reason that is needed for developing any self-instructional material. Every module contained activity items as well as self-check items and could be read independently of other modules. The materials were tried out, modified and the final drafts edited by professional researchers were effective in teaching educational research at post-graduate level. The reaction of the users towards the modules was positive.

Arockibm (1990) developed self-learning package to develop questioning skills among primary school teachers and found that teachers improve their questioning skills and the self-learning package was found to be effective.

Bhattacharya (1990) prepared a module on concepts in Botany and General Biology for secondary and higher secondary levels using environment and local resources with a different orientation and found it effective for developing the investigative competencies of teachers.

Pant (1992) developed self-guidance modules for secondary and senior secondary school students for reaching the maximum number of students for guidance benefits. The modules were found to be effective in developing the skills of learning.

Kaushal (1994) attempted to compare the effectiveness of individualized and group instructional modules for teaching bio-sciences to class IX in terms of achievement, retention, willingness and reaction towards module and found that instructional modules (GIM) proved to be more effective than individualized instruction modules for improving scholastic achievement of students.
Pant (1997) revealed that students' achievement in bookkeeping and accountancy increases significantly by making use of the guided instruction through self-learning modules.

Thompson (1997) examined the effect of teaching methods, self-learning modules (SLM) and lecture/discussion in nursing orientation programme for preference at knowledge level. The results of this study showed no significant difference in the post-test score, neither between the groups receiving SLM and lecture/discussion nor in the level of satisfaction between the groups receiving formative and summative evaluations.

Kapoor (1999) compared new approaches of teaching with conventional method of teaching in the learning of English Grammar. The investigator made an attempt to try out the Modular Approach (MA) and Personalized System of Instruction (PSI) in the teaching of English Grammar on 45 students of VII class of High School and found that there is significant difference in the achievement of students in the form of scores on summative criterion test of the three groups of students: one following Modular Approach, other following Personalized System of Instruction and third following Conventional Method of teaching. Since the mean score of MA group (14.82), PSI group (12.99) is significantly higher than the mean score of CM group (8.27), which may be interpreted that MA and PSI approaches of teaching were found quite effective and superior to CM of teaching in the teaching-learning process of English Grammar. However, there is no significant difference in the achievement scores of MA and PSI groups of students. Both the new approaches are equally effective and positive in nature.

Nath (2000) developed a self-instructional package for secondary school Biology teachers for their in-service learning and found that the mean percentage score obtained in the achievement test by the teachers was 67%. The error rate committed by the respondents was 32.68%. The qualitative analysis showed that various aspects of the development of the self-instructional package was very much effective.
Dubey and Khuntia (2000) developed a module in Guidance and Counselling on "Vocational Guidance" for B.Ed. students with the objectives to test the effectiveness of the module in terms of reactions of students towards the module and to compare the mean achievement scores of students having higher and lower study habits and reported that the module was found to be effective in terms of students reactions towards it and study habits of students have no effect on their post test achievement scores.

Jayalakshmi (2001) developed instructional modules in Educational Psychology for B.Ed. students and studied the effectiveness of the modules as instructional materials in respect of intelligence and English reading comprehension. The instructional materials prepared in modular forms comprised of learning experiences in the form of programmed learning material (PLM), practical work, classroom observation, library work, study of additional reading materials, self-check and group discussions. The instructional modules had potentialities for learning educational psychology in an effective manner.

Pecoraro (2002) developed a module on interpersonal skills for home economics teachers and evaluated it in two teaching modes. He found the module effective in both the modes for the cognitive and affective development of teachers. And also Found Significant relationship with students Achievement.

Freeland (2004) prepared self-instructional modules in increasing the social studies knowledge of students enrolled in a teacher education program. Students enrolled in social studies methods courses were divided into an experimental group (n=45) which used the modules and a control group (n=55) which read a textbook chapter dealing with the social sciences. The six self-instructional modules were constructed by consulting introductory college textbooks in history, geography, sociology, economics, political science, and anthropology, as well as social studies methods texts. Each experimental student read some material, answered a question, and checked it with a key. All students took researcher prepared pre- and post tests and the standardized Tests of Academic Progress. Students who used self-instructional modules achieved more than students who learned about social sciences from a textbook.
Culbertson et al. (2004) examined whether technology education improves students' achievement scores in the five areas of reading, language arts, mathematics, science, and social studies. Based on analysis of the data collected in this study, they concluded that there was no significant achievement gain between those students who had participated in a unit of modular technology education and those students who had not. The results of this study did not support the claim that participation in a modular technology course can increase students' achievement.

Haukoos (2007) examined the effects of slide-tape self-instructional modules on community college biology students' final course grades and feelings about course participation. Data indicate significant gains on one of four content area achievement tests, significantly better overall grades, and positive student reactions.

Khalil et al. (2010) studied qualitative and quantitative approaches to evaluate the effectiveness of self-learning modules (SLMs) developed to facilitate and individualize students' learning of basic medical sciences. Twenty physiologies and nineteen microanatomy SLMs were designed with interactive images, animations, narrations, and self-assessments. Out of 41 medical students, 40 students voluntarily completed a questionnaire with open-ended and closed-ended items to evaluate students' attitudes and perspectives on the learning value of SLMs. Closed-ended items were assessed on a five-point Likert scale (5 = high score) and the data were expressed as mean plus or minus standard deviation. Open-ended questions further evaluated students' perspectives on the effectiveness of SLMs; student responses to open-ended questions were analyzed to identify shared patterns or themes in their experience using SLMs. The results of the midterm examination were also analyzed to compare student performance on items related to SLMs and traditional sessions. Students positively evaluated their experience using the SLMs with an overall mean score of 4.25 (SD plus or minus 0.84). Most students (97%) indicated that the SLMs improved understanding and facilitated learning basic science concepts. SLMs were reported to allow
learner control, to help in preparation for subsequent in-class discussion, and to improve understanding and retention. A significant difference in students' performance was observed when comparing SLM-related items with non-SLM items in the midterm examination (P less than 0.05). In conclusion, the use of SLMs in an integrated basic science curriculum has the potential to individualize the teaching and improve the learning of basic sciences.

Tyagi (2011) studied the “Effectiveness of computer assisted Modules on the Basis of Achievement in Biology.” For this mean, s.d. and t-value were computed. It has been found that mean Achievement score of experimental group was significantly higher than that of the control group. Therefore, computer assisted modules was found effective to enhance achievement of students in Biology.

Wolters (2011) concluded that Self-Learning Modules resulted in better learning process. It could help students create better learning habits and strengthen their study skills.

Bednall and Kehoe (2011) examined the effectiveness of providing instructional support for the self-Learning Modules and found superior performance on a subsequent test of application relative to a control group.

Ladell (2012) studied a self directed learning module to guide graduate students through the process of researching and writing a literature review. Students can access the literature review Guide on demand to diagnose learning needs, examine a variety of multimedia tools and resources, select appropriate learning strategies, and evaluate their own learning outcomes. Self directed learning modules improved digital literacy skills for any student learning online.

Alias and Sira (2012) studied at designing and developing a Physics module based on learning style and appropriate technology in secondary educational setting by employing Isman Instructional Design Model and to test the effectiveness of the module. Findings from evaluation of the module conducted among 120 participants involving 30 participants of each learning style (visual/verbal, active/reflective) suggested that the modules are very effective for learners.
Osman et al. (2012) studied Interactive module with pedagogical agent (IMMPA) named Electrochemistry Lab was developed in order to assist students in the learning of Electrochemistry topic. A non-equivalent pre-test post-test control group design investigation was carried out in order to gauge the effect of EC Lab on students’ understanding in the learning of Electrochemistry. Some 127 Form Four students from two secondary schools were involved in the study. Instruments involved were achievement tests and EC Lab. Results showed significant relationship between control group and treatment group in the understanding of concepts in the learning of Electrochemistry.

2.2 Multimedia Instructional Strategy and Achievement

Vardhini (1983) developed a multimedia instructional strategy for teaching science (physics and chemistry) at secondary level for students of class 8th and studied the relationship between achievement using intelligence and strategy. The major findings of study were that almost all the units indicated high level of performance in the test. There was a significant relationship between multimedia instructional strategy and achievement.

Singh (1983) strongly advocated that the use of media treatment in the teaching–learning process was capable of creating ideal classroom situations and it was helpful in achieving high scores in students.

Krishnan (1983) developed a multimedia package for teaching a course on Audio-Visual Education, including programmed slides, programmed print material, non-projected visual aids, self-instructional material with manuals for practical exercises, self-evaluating unit tests, feed back etc. and found it quite effective.

Greenberg (1984) compared the effectiveness of computer assisted videocassette lessons with that of videocassette lessons and paper-pencil practice. The findings revealed that there was no significant difference existed between the post test performances of the two groups.
Wagh (1991) developed a multimedia instructional system for remedial measures in fractional numbers, according to the multimedia instructional system for developing computational skills and compared the results of this approach to those of traditional approach of remedial teaching to find the difficulty level of skills experienced by the students in fractional numbers. Study was conducted on a sample of 120 students of 8th grade. Traditional instructional system (TIS) and multimedia instructional system (MIS) remedial approaches both helped students in improving their performance and no significance difference was found.

Arbour (1994) developed a multimedia package that included video cassette, a guide, six posters to provide a teaching outlines on Great Lakes Fisheries for middle end high school. The package was found effective in both formal and informal school settings.

Beichner (1994) examined the cognitive and affective impact of a multimedia editing to promote science learning. He also found that students were highly motivated to work cooperatively and without teacher supervision in such environments.

Reddy and Ramar (1995) investigated the effectiveness of multimedia modular approach in teaching mathematics to 50 low achievers of VIII standard and compared with the traditional lecture method. They found that the experimental group performed significantly better than the control group on the post- test that indicated the superiority of multimedia modular approach over the traditional lecture method.

Dixon (1995) observed eight-grade students in a bilingual classroom, explored the geometric concepts of reflection and rotation and concluded that using computer-based dynamic instruction had a positive effect. These cases supported the use of computers as a part of multimedia to enhance learners’ spatial ability as well as concept formation in learning mathematics.

Sewell et al. (1995) found that the over all response of under graduate students using multimedia computer packages were Significant. The study concluded that multimedia computer technology presents a powerful aid in the teaching and assessment of Biological science.
Williamson and Abraham (1995) found that using animations in a chemistry course, where students had difficulty with mental models about the particulate nature of matter, students obtained significantly higher test scores when the animation was viewed as part of a lecture or as a supplement to individual study compared with a control group of students who did not have access to the animation.

Moore and Miller (1996) determined how the use of multimedia affected student learning, class attendance, and retention of information. The sample studied included several sections of the same introductory biology course for non-majors from the University of Cincinnati. They found that the use of multimedia increased class attendance and enhanced retention. In addition, there was a significant improvement in students' grades.

Mayor (1997) studied whether multimedia instruction is effective, noticed a consistent evidence for multimedia effect. Students who received coordinated presentation explanations in verbal and visual format generated a median over 75% more creative solutions on problem solving transfer test than students who received verbal explanations alone.

Crosby and Iding (1997) examined high school students’ performance on an interactive multimedia computer tutorial for learning Physics concepts in conjunction with their individual differences and indicated that this approach is more effective.

Reddy (1997) studied the effectiveness of multimedia instructional strategy in teaching science to slow learners and the result reveals that it enabled the slow learners to cope with normal students to a considerable extent.

Schnackenberg (1997) showed that a relatively full version of computer-based multimedia instructional program is more effective for improving student achievement and learner control in an instructional program is more appealing for students than program control.

Yasmin et al. (1998) designed a project on collaborative educational multimedia and the findings indicated that students improved significantly in their Science understanding programming skills.
Mehryar (1998) conducted a survey on the effectiveness of a web-based interactive multimedia system in tertiary education. The results of the survey conducted during the course indicated that students were enthusiastic towards the new multimedia packages.

Mackenzie and Jansen (1998) examined the effectiveness of Multimedia Computer-Based-Instruction (MCBI) through quantitative analysis and explored student attitudes toward using MCBI in the classroom. The MCBI treatment consisted of 2-D and 3-D images, animations, and audio elements that were all integrated into a highly interactive presentation using an authoring software program. In contrast, the traditional instruction treatment consisted of black and white still-image transparencies and selected physical models. The results of this study indicated that MCBI held promise for improving teaching of technical graphics.

Ayres and Melear (1998) found that there was an increased learning of physical Science concepts via Multimedia when compared to the traditional hands-on exhibit in a Science museum.

kumar (1998) found that media-based instructional strategy is more effective in creating environmental theory and application awareness than conventional text book approach among primary school pupils of Kerala.

Swaminathan (1998) conducted a study on "Impact of Multimedia Package on the Teaching of Commerce with performance to select variables." The study found that the use of multimedia package was more effective than conventional method of teaching.

Carter (1999) stated that multimedia technology is able to offer quickly accessible information that can interest students of all learning abilities and techniques. Students can interact with the various forms of multimedia in order to properly structure their schemata of conceptual knowledge, allowing them to become better learners as well as problem-solvers.

Koroghlanian (2000) investigated the effects of multimedia as audio, animation and spatial ability in a computer-based instructional program for biology. Results indicated that high spatial ability participants achieved more
than low spatial ability participants. In terms of attitude, participants responded favourably to computer-based instructional program and felt that static illustrations or animations made the explanations easier to understand and concentrated on learning the material. Further more, participants in the animation treatment felt that the information was easier to understand than participants in static illustration treatment.

**Thillaka and Pramilla (2000)** conducted a study to find out the influence of computer based multimedia programme on achievement in mathematics among high school students and to find difference in achievement in mathematics between high achievers and low achievers. A sample of sixty two students of class 9th was selected. Findings revealed that there was no influence of computer based multimedia on the achievement in mathematics among high school students. There was no significant difference in achievement of mathematics between high achievers and low achievers for both experimental and control group.

**Ribber and Hannafin (2001)** compared the effect of text, animation and animation + text far learning of Newton’s law of motion (N=111 students) Assumption for the study was that animations are most suited to represent spatially oriented information. The animation, presented was very simple in nature which enabled the students to focus on essential information. The learning effect was measured by rule using and problem solving ability, and explained this by the fact that the presentations with animations resulted in less time spent on studying the tasks.

**Lahti (2001)** conducted a study on improving understanding of atoms, molecules and bonding through computer simulations and found that the topics of atomic structure, bonding and balancing equations can be difficult for student to comprehend. Some of this problem centers on the ability to visualize abstract ideas. Through the use of computer programs and websites, models were provided that could make these topics more concrete. Based on student feedback, these interactive programs were found more successful.
**Boster and Juge (2002)** conducted a study for using multimedia technology to improve student achievement and examined the integration of standards-based video clips into lessons developed by classroom teachers and found increase in student achievement and a Significant relationship with students retention. A study of more than 1400 elementary and middle school students showed an average increase in learning for students exposed to video clips application compared to students who received traditional instruction alone.

**Mayer (2003)** conducted a study on the promise of multimedia learning by using the same instructional design methods across different media, and explored a program of research aimed at determining, research-based principles for the design of multimedia explanations which could be called methods and to find extent to which methods were effective across different learning environments. Conclusions drawn were: (a) a multimedia effect in which students learnt more deeply from words and pictures than from words alone-in both book based and computer based environments. (b) A coherence effect – in which students learnt more deeply when extraneous material was excluded rather than included in both book-based and computer based environments. (c) A personalization effect – in which students learnt more deeply when words were presented in conversational rather than formal style both in computer based both in computer based environment containing spoken words and those using printed words.

**Chen and McGrath (2003)** investigated how hypermedia design tasks affected student engagement and how creating collaborative hypermedia documents affected students' conceptual learning. The study found a high degree of student attention to organizing information, as well as increased organization and elaboration of concepts in student work.

**Rossler (2003)** conducted a study on the effects of hypertext in a multimedia environment on the achievements in Islamic studies of elementary and junior high school students aimed at investigating the impact of learning using hypertexts in a multimedia environment upon the students’ scholastic achievement. The study was implemented with pre-adolescents and
adolescents. Findings revealed that the achievements brought through PC-aided learning were higher in all parameters.

Malliga (2003) studied the relative effectiveness among PBL (peer-based learning), ILMMP (individualized learning supported by multimedia presentation), and IILMMP (interactive individualized learning supported by multimedia presentation) in terms of development of cognitive skills at different levels of knowledge, understanding and application among students of class IX. Quasi experimental method was adopted for study. A sample of 108 girl students was taken. It was concluded that Interactive individualized learning supported by multimedia presentation (IILMMP) was found to be the most effective strategy among all the three instructional strategies viz. PBL, ILMMP, IILMMP in terms of cognitive skills such as knowledge, understanding and in realizing the instructional objectives. It was influenced that irrespective of difficulty level of content, IILMMP was found to be the most effective and significant one, while ILMMP was least effective.

Stith (2004) reviewed the issue with a focus on cell biology teaching animations, were contrary to the one mentioned above. And reported an initial study where, after a formal lecture on cell death (apoptosis) illustrated with static graphics, some students were subsequently shown an animation after which all students were tested. The students who viewed the animation scored significantly higher on the test than those who had not viewed the animation.

Chitlipuh (2004) conducted a study on multimedia software programs for on-line instruction and remediation in relation to cognitive style of high school students. The objective of study was to study effectiveness of multimedia software programmes for online instruction and remediation learning as compared to conventional instruction method and to study relationship of cognitive style with achievement through multimedia software programmes for on-line instruction. Conclusions of the study were: a) the two instructional treatment strategies (MMO and CGL) were not found equal in respect of the gain means yielded by them. b) Multimedia on-line instruction resulted into higher gain means as compared to conventional group learning.
Lewis et al. (2005) undertook a study to explore whether utilizing technology in an undergraduate classroom would increase student understanding of material, attendance, positive teaching evaluations, and student multimedia self-efficacy. Results indicated a significant difference between a traditional and multimedia class in terms of attendance and teacher evaluations, and no differences with regard to students grades achievement.

Koeber (2005) used a quasi-experiment and follow-up questionnaire to ascertain, the effects of PowerPoint multimedia presentations and a Blackboard course website on the course grades and perceptions of teaching effectiveness of introductory sociology students. Results of t-tests showed no statistically significant difference in course grades between experimental and control groups.

Jayaraman (2006) carried out “A study of the relative effectiveness of Computer based Multimedia Learning Packages on performance and behavioural outcomes of students of different age groups”. Various findings of the study were: (i) The CBMMLP prepared specifically for the particular concepts were significantly effective for all the age group of students. There had been found a higher usage by higher age group students; (ii) the relative effectiveness of the CBMMLP was significant for all the age groups of students, who were studying in classes V, VIII and XI.

The performance of the students who learned through CBMMLP was higher than the performance of the students who did not learn through CBMMLP; (iii) higher age group students were found to have more positive attitude towards CBMMLP than the lower age group students; (iv) the higher age group students were found more auditory preferred than the lower age group students, whereas the lower age group students were found more visually preferred; (v) higher age group of students were found more satisfied more in the interaction with the CBMMLP. Also, 74.2% of class XI students were found having prior knowledge of the computer. 75% of the class V students could not express either their satisfaction or about their prior knowledge.
Sunder (2006) conducted a study on effect of computer based multimedia instructional strategy on achievement in English language in relation to anxiety and parent child relationship. The objective of the study was to study and compare the effect of computer based multimedia instructional strategy and traditional methods on use of grammar in English language. Findings of the study were that a) significant relationship was found in achievement of students in English language between the groups with regard to methods of teaching. The mean scores of group-I (Taught from computer based multimedia instructional strategy) showed that group I scored higher than group II. b) Computer based multimedia instructional strategy using CD-ROM was found slightly better than traditional methods of verbalism and print media.

Kumar (2007) compared effectiveness of audio-video instructional system (AIS), multimedia instructional system (NIS) and conventional; instructional system (CIS) in terms of achievement and studied relative retention in learning through audio-video instructional system, multimedia instructional system and conventional instructional system. Total 120 students were selected randomly. There was a significant difference between the mean achievements of students receiving instructions through different instructional system. Multimedia instructional system was found to be the best instructional system than two instructional systems i.e. Audio-Video instructional system and conventional instructional system. AIS were better than CIS. The relative comparison of three instructional systems on retention was made by using the assumption that a method lower on mean score i.e. mean score of MIS was termed as more effective as compared to method having higher mean scores i.e. AIS and CIS on retention.

Nimavathi and Gnanadevan (2008) conducted a study on “Effectiveness of Multimedia Programme in Teaching Science”. Objectives of the study were: (i) To prepare multimedia package for the teaching of Science at secondary level; (ii) to find out the effectiveness of computer multimedia program in the teaching of science at secondary level; (iii) to compare the effectiveness of computer multimedia programs in the teaching of science with traditional
method of teaching science. The findings of the study were: (i) There was no
significant difference between the experimental group and control group in the
achievement of science at pre-test level; (ii) there was a significant difference
between the experimental group and control group in the achievement of science
at post-test level. The students learning with the help of multimedia program
were fared better in science than the students learning through the conventional
method; (iii) there was a significant difference between the mean achievement
test scores of the pre-test and post-test for the experimental group. This shows
that the multimedia program has helped the students to score more marks in the
post-test; and (iv) there was no significant difference between the pre-test and
post-test in the achievement of science for the control group. This has shown
that the conventional method of teaching will not help the students to score
more marks in the post-test.

Khirwadkar (2008) conducted a study on integrating multimedia
package at pre-service level. The objectives of the study were to develop a
multimedia package for laboratory method in teaching of chemistry at pre­
service level, to implement multimedia package in actual class room situation
at pre-service level and to study effectiveness of developed package. The
sample included eighteen B.Ed students. The multimedia package consisted of
video-clippings, text, pictures, animation compiled in Microsoft font page.
Multimedia package was found to be effective in learning the concept of
management of chemistry laboratory after analysis of pre-test and post-test
scores.

Gili et al. (2008) conducted a study to determine whether the use of
computer animation and illustration activities in high school can contribute to
student achievement in molecular genetics. Three comparable groups of
eleventh- and twelfth-grade students participated: the control group (116
students) was taught in the traditional lecture format, whereas the experimental
groups received instructions that integrated a computer animation (61 students)
or illustration (71 students) activities. It was found that students who
participated in the experimental groups improved their knowledge in molecular
genetics compared with the control group. The open-ended questions revealed that the computer animation activity was significantly more effective than the illustration activity. Based on these findings, use of computer animations in molecular genetics, especially when teaching about dynamic processes was suggested as it improves their achievement in comparison to traditional instruction.

**Zheng et al. (2008)** investigated the effects of multimedia and schema induced analogical reasoning on science learning. The multivariate analyses of covariance revealed significant main effects for multimedia and analogy learning as well as a significant interaction between multimedia and analogy. The findings showed that schema induced analogical reasoning could significantly improve science learning and that multimedia becomes more effective when it is integrated with an instructional method.

**McNeill et al. (2009)** studied the effects of training, modality, and redundancy on the participants' ability to apply and recall a historical inquiry strategy. An experimental research design was utilized with presentation mode as the independent variable and strategy application and strategy recall as the dependent variables. The participants were engaged in the multimedia intervention for a total of five days, for approximately 30 minutes a day. The results of the study revealed significant differences in the training main effects analysis indicating that strategy instruction can be effectively provided in a multimedia learning environment.

**Gregorius et al. (2010)** developed two animations, one focused on the macroscopic phenomena and particulate conception of the three states of matter and the effects of heat on these states, and the other on solution formation and solubility were produced using Adobe Flash MX software. The first was designed for and tested on elementary school (3rd -5th grade) students. The second was tested on secondary school chemistry students. The materials were prepared according to established multimedia learning design guidelines. A pre- and post-test study was used to compare the learning gains of the students who received the animations with those who received textbook reading time.
and discussion in class. The pre- and post-test data indicated that while both groups showed learning gains regardless of the provided mode of instruction, those who received the animations obtained higher scores than the control group.

**Stanwick (2010)** examined whether presenting a multimedia case study enhanced the learning experience of students in an undergraduate management class. A questionnaire was administered before and after the presentation of the case study and the results showed that the multimedia case did indeed enhance the learning experience of the students. The students were positively related on their attitudes related to both management and business ethics constructs. The results demonstrated that multimedia case studies were valuable tools that could be used by instructors to develop a more interactive learning environment.

**Rolfe and Gray (2011)** investigated multimedia as a substitute for laboratory practicals, multimedia improved student learning gains assessed with an end-of-year examination, (mean difference 7.06, plus or minus 4.61) multimedia learning was more effective than many traditional educational methods.

**Samur (2012)** designed a study to examine the effect of the redundancy principle in a multimedia presentation constructed for foreign language vocabulary learning on undergraduate students’ retention. The underlying hypothesis of this study was that when the students were exposed to the material in multiple ways through animation, concurrent narration, and concurrent text (ANT), the learning and the retention would have better results in foreign language learning. Overall, the results showed that adding on-screen text to a multimedia presentation with animation and narration helped students to learn new vocabulary in a previously unfamiliar foreign language.

**Kim (2012)** investigated the effects of three different screen sizes (small, medium and large) and two types of multimedia instruction (text only and text with pictorial annotation) on vocabulary learning. One hundred thirty-five Korean middle school students learning English as a foreign language were randomly distributed into six groups and were given a pre test, a self-
study multimedia instruction, a post test and a retention test online. The pre

test, post test and retention test were identical and included 30 vocabulary
questions. Results showed that the large screen multimedia instruction helped
the students to learn English vocabulary more effectively than the small screen
instruction as demonstrated on both the post test and retention test.

**Yadav (2013)** investigated superior performance of experimental group
(Multimedia Package) over the traditional group which suggested that
Multimedia Package was found effective and significant related with Students
Learning. A focused treatment with learning material of multimedia techniques
enhanced the achievement of students of experimental group in Geography.

**Maree et al. (2013)** studied combines work on concept mapping with
scripted collaborative learning. The objective was to examine the effects of
self-regulated science learning through scripting students' argumentative
interactions during collaborative "multimedia-enriched skeleton concept
mapping" on meaningful science learning and retention. Programme
description: Each concept in the enriched skeleton concept map (ESCoM)
contained annotated multimedia-rich content (pictures, text, animations or
video clips) that elaborated the concept, and an embedded collaboration script
to guide students' interactions. Sample: The study was performed in a
Biomolecules course on the Bachelor of Applied Science program in the
Netherlands. All first-year students (N = 93, 31 women, 62 men, aged 17-33
years) took part in this study. Design and methods: The design used a control
group who received the regular course and an experimental group working
together in dyads on an ESCoM under the guidance of collaboration scripts. In
order to investigate meaningful understanding and retention, a retention test
was administered a month after the final exam. Results: Analysis of covariance
demonstrated a significant experimental effect on the Biomolecules exam
scores between the experimental group and the control, and the difference
between the groups on the retention test also reached statistical significance.
Conclusions: Scripted collaborative multimedia ESCoM mapping resulted in
meaningful understanding and retention of the conceptual structure of the
domain, the concepts, and their relations. Not only was scripted collaborative multimedia ESCoM mapping more effective than the traditional teaching approach, it was also more efficient in requiring far less teacher guidance.

Rusanganwa (2013) studied on theories of cognitive load and multimedia learning to explore learning in a one-computer classroom in an environment where textbooks and multiple computers are not available. Two groups of students attended a 4-week English-language technical vocabulary course (eight three-hour sessions) taught by two ESP trained science teachers. One group (n = 13) was taught using computer-mediated multimedia to present technical vocabulary on-screen. The other group (n = 19) received blackboard presentations employing traditional methods to help students internalize the same vocabulary. Post-test scores of the two groups were compared. The results showed that the effect of multimedia on the recall of the concepts taught was large (Cohen's "d" 0.95).

2.3 Achievement and Cognitive Styles

Rahul (1983) reported that field independences had positive relationship with total achievement and in different school courses. More the field independence, higher the achievement of the students.

Verma and Swain (1991) studied “the effect of cognitive Styles on scholastic achievement” and showed that field independent cognitive Styles group obtained significantly higher mean scores in English, Maths, general science, social studies and drawing and in total achievement than their field dependent counterparts.

Kumar and Sudesh (1998) studied that interaction of approaches to study the effect of Cognitive Styles on achievement in biological science. The findings revealed no significant, main effect of Cognitive Styles on the achievement in Biology.

Kirk (2000) investigated the relationship of cognitive styles to achievement in chemistry. Results indicated that field independence has significantly correlated with academic achievement in chemistry.
Angeli and Valanides (2004) conducted a study in which Sixty-five undergraduates were classified into field-dependent, field-mixed, and field-independent learners, and were randomly assigned to two groups: text-only and text-and-visual. Participants in the text-only group received a description of a model in textual format, whereas participants in the other group received the same description in textual-and-visual format. Participants were then asked to individually explore a computer model, test hypotheses, and solve a problem related to immigration policies. Their problem-solving performance was analyzed using a 3 * 2 analysis of variance (ANOVA). Results showed that the text-and-visual group outperformed the text-only group, that performance was significantly related to field-dependence-independence, and that there was a significant interaction effect. Specifically, field-independent learners in the text-and-visual group outperformed field-dependent and field-mixed learners in both groups, and field-independent learners in the text-only group.

The findings indicated that adding visuals to textual explanations could enhance understanding, and that the functional role of visuals depended on cognitive differences.

Deture (2004) designed a study to identify those learner attributes that may be used to predict student success (in terms of grade point average) in a Web-based distance education setting. Students enrolled in six Web-based, general education distance education courses at a community college were asked to complete the Group Embedded Figures Test for field dependence/independence and the Online Technologies Self-Efficacy Scale to determine their entry-level confidence with necessary computer skills for online learning. Although the students who were more field independent tended to have higher online technologies self-efficacy, they did not receive higher grades than those students who were field dependent and had lower online technologies self-efficacy. Cognitive style scores and online technologies self-efficacy scores were poor predictors of student success in online distance education courses.
Kumar (2006) in his study found that tribal and non-tribal students of 12th grade differed significantly with respect to field independent and field dependent cognitive styles. Non-tribal students were found higher on field independent cognitive Styles than tribal students.

Altun and Cakan (2006) investigated cognitive styles, achievement scores and attitudes toward computers among university students. Field dependence/field independence is a dimension of cognitive style that has been researched with various student groups as well as with attitudes. Nevertheless, there appears to be a dearth of published research in this area relevant to teacher trainees in an international setting. In this study, the standardised Group Embedded Figures Test was used to assess field dependency among 130 teacher trainees. Overall, it was found that there was no significant relationship between cognitive styles and academic achievement.

Geetanjali (2007) conducted a study of academic achievement in relation to cognitive styles and hemispheric city at secondary stage and found that cognitive styles had a significant effect on students’ academic achievement. More the field independence of the students, higher the academic achievement.

Salmani and Mohammad (2007) conducted a study in which it was hypothesized that field dependence or independence would introduce systematic variance into Iranian EFL learners’ overall and task-specific performance on task-based reading comprehension tests. One thousand, seven hundred, forty-three freshman, sophomore, junior and senior students, all majoring in English at various Iranian universities and colleges, took the Group Embedded Figures Test (GEFT). The resulting 582 field-independent (FI) and 707 field-dependent (FD) students then took the 1990 version of IELTS. Using SPSS commands for collapsing continuous variables into groups and participants' IELTS scores (based on the 25th, 50th, and 75th percentiles), four proficiency groups were identified for each cognitive style. From each proficiency group, 36 FD and 36 FI individuals were selected through a matching process. The resulting sample of 288 participants took the Task-Based Reading Test (TBRT) designed for the study. Data analysis revealed that
individuals' cognitive styles resulted in a significant difference in their overall test performance in the proficient, semi proficient, and fairly proficient groups, but not in the low-proficient group. The findings also indicated that cognitive style resulted in a significant difference in the participants’ performance on true-false, sentence completion, outlining, scanning, and elicitation tasks in all proficiency groups.

**Gupta (2008)** examined that interaction of approaches to study the effect of cognitive styles on achievement in physics, and found that cognitive styles had a significant effect on students’ achievement in physics.

**Suet (2009)** stated that field independent students were generally expected to perform better academically than those who were field dependent, and this way particularly marked in distance learning where students learn without the traditional support offered in conventional instruction. In this paper two studies of the relationship between field dependence and academic learning in the context of distance learning were reported with Bachelor of Health nursing students in Hong Kong.

In both studies field independent nurses performed significantly better than field dependent ones. Some implications of these findings for distance learning were discussed.

**Griffin and Franklin (2010)** conducted a study on one hundred and forty-three subjects which were identified as Field Independent or Field Dependent based on their performance on the Group Embedded Figures Test (GEFT), a measure of cognitive style. Results indicated that Field Independent students performed significantly better on course tests and had higher academic potential, as measured by the ACT, than Field Dependent students.

**Ipek (2010)** investigated the effects of CBI lesson sequence type and cognitive style of field dependence on learning from Computer-Based Cooperative Instruction (CBCI) in WEB on the dependent measures of achievement, reading comprehension and reading rate. Eighty-seven college undergraduate students were randomly assigned to lesson sequence type levels, after assigning into three cognitive style group: field dependent (FD), field
neutral (FN) and field independent (FI), based on the Group Embedded Figure Test (GEFT) scores. Instruction was delivered by means of two types of sequence of lessons for CBCI in WEB, linear lesson (LL) and branching lesson (BL). A two-way analysis of covariance was used to investigate whether there were significant effects and interactions between cognitive style of field dependence and lesson sequence types. In order to control statistical power and to equate the treatment groups, Nelson-Denny Reading Comprehension Test scores were used as a covariate. The analysis of regression coefficients between lesson sequence type and dependent variables and between field dependence and dependent variables was shown in tables. Although the findings showed non-significance in formal tests of hypotheses, the interaction effects between field dependence and lesson sequence types on dependent measures were clarified.

Tinajero and Paramo (2010) reviewed research into the possible effects of field dependence/independence on achievement at school, and found that field-independent subjects performed better than field-dependent subjects, whether in a specific discipline or across all subjects.

Pannu (2010) Cognitive style influenced the academic achievement of adolescents. Adolescents having different levels (systematic, intuitive, integrated, undifferentiated and split) of cognitive style possessed different levels of academic achievement. Adolescents having integrated cognitive style possessed higher academic achievement than those having systematic, intuitive, undifferentiated and split cognitive style.

Linder (2011) suggested that field independent (FI) dental students perform better in pre-clinical laboratory courses than field dependent (FD) students. A study was conducted to determine the relationship of cognitive learning style to academic performance with 66 second year dental students at Virginia Commonwealth University (Richmond). A brief demographic questionnaire and the Group Embedded Figures Test (GEFT) were administered to the students who had completed three pre-clinical courses containing laboratory components which required demonstration of
psychomotor skills. Pre-Clinical grades based on laboratory projects requiring psycho motor skills were also gathered. Results indicated that: (1) students as a whole were field independent; and (2) there were no statistically significant gender, race, or ethnic differences concerning cognitive style. However, a statistically significant relationship existed between the Group Embedded Figures Test scores and preclinical course grades, and also between student handedness (right versus left hand dominance) and cognitive style. Students who were ranked upper third of the class by course grades were the most field independent learners. Right handed students were more field independent than left handed students. Dental educators could identify FD students through the GEFT and institute program changed to meet their learning needs. Seven references and one figure were included.

Nicolaou and Xistouri (2011) investigated that relationship between field dependence/independence cognitive style and problem-posing ability among sixth grade students. The 94 students' sample was clustered into three groups, according to the cognitive-style field dependence/independence (field dependents, field dependents, field mixed and field independents).

The results showed that field-independent participants outperformed field-mixed and field-dependent ones in both problem-posing ability and the complexity of the problems posed. It was also found that the content of the task influenced the differences between the three groups of students as regards the ability in problem posing and the complexity of the problems posed; while in the first (informal context), second and fourth task differences were found between the groups, in the third task (formal context), no differences were evident.

Wei and Sazilah (2012) investigated levels of cognitive styles are positively and significantly correlated with the achievement of students, field independent learners performed better than field dependent learners.

Kumar (2013) concluded that the field independent group of students had higher Learning Acquisition than that of the field dependent group of students.
Tinajero et al., (2013) studied the influence of the cognitive style called field dependence-independence on academic achievement of Brazilian university students was explored as well as the mediating effect of learning strategies on that influence. Results of a regression analysis showed that cognitive style significantly contributed to academic achievement.

2.4 Studies on Achievement Motivation

Jain (1983) studied that processes and products of concept formation under different levels of intellectual development and achievement motivation on the sample drawn from higher secondary Hindi medium schools and found that achievement motivation had a significant effect upon the concept formation ability, high achievement motivation-high intelligence group was significantly better in concept formation ability than low achievement motivation-low intelligence group.

Pattnaik and Sween (1984) found that achievement motivation and academic achievement were significantly correlated with each other.

Kaur and Vimla (1985) concluded that there was highly significant and positive relationship between achievement motivation scores and achievement scores; high n-Ach students achieve significantly higher than the students with low achievement.

Ahluwalia (1985) found a significant and positive effect of achievement motivation on scholastic performance.

Ghoash (1985) studied the achievement of the students in Chemistry and investigated the determinants of achievement in Chemistry. He found that there was a positive correlation between the scores in Achievement Test in Chemistry and Achievement Motivation Test.

Fatrali (1986) studied the effect of motivation on academic achievement in a distance education setting. The concept of motivation was measured by three factors: academic self-concept expectancy and value of success. The study showed a positive and significant effect of achievement motivation and achievement.
Natesan and Seeta (1986) conducted a study to find the relationship between achievement motivation and achievement. A sample of 60 students, 30 high achievers and 30 low achievers from Standard XII was selected. The results showed that (i) the high achievers had high achievement motivation scores when compared to the low achievers; (ii) the critical ratio revealed that there was significant difference between high achievers and low achievers with regard to need for achievement scores; (iii) there was significant positive correlation between achievement motivation and academic achievement.

Kaur (1987) indicated that significant effect was found between the levels of achievement motivation and academic achievement.

Gawande (1988) studied the relationship between achievement motivation and scholastic achievement on sample of higher secondary students studying in class XI of Amaravati district of Maharashtra and found positive that correlation between achievement motivation and scholastic achievement.

Kaul and Bhadwal (1989) studied the effect of unit test on achievement motivation of high school students in Mandi district of Himachal Pradesh and found that the experimental and control groups, on an average, exhibited the same level of achievement motivation at the end of instruction as well as twenty days after the completion of instruction.

Biggs (1989) studied the relationship of achievement motivation and achievement of emotionally and behaviourally handicapped children. The study found that controlling intelligence, there was no significant relationship between achievement motivation and achievement.

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

Yeh (1991) conducted a study to find out the relationship of academic achievement to the variables of achievement motivation, study habits and intellectual development. The important finding of the study was that a weak but positive correlation was found between achievement motivation and academic achievement.
Verma and Swain (1991) indicated that achievement motivation had significant effect on academic achievement.

Baskaran (1991) studied the relationship between achievement motivation and attitude towards problem solving and achievement in Mathematics and reported that there was significant effect of achievement motivation on achievement in Mathematics, achievement motivation on attitude towards Mathematics.

Rani (1992) studied the differences in achievement motivation based on SES and relation between academic achievement and achievement motivation on the sample of boys and girls of Science and Arts group and found that girls were higher than boys in achievement motivation and all groups showed a significant effect of academic achievement motivation on achievement.

Stone (1994) reported that achievement motivation measured through academic performance in Officer Training School (OTS) and found significant and positive relationship between achievement motivation and academic performance of candidates.

Ayishabi and Kuruvilla (1998) studied achievement motivation of secondary school children of working and non-working mothers on the sample drawn from the schools of Kerala state and found that achievement motivation, a strong determinant of academic performance.

Chakravarty (1999) found high, positive, significant correlation between scholastic achievement and achievement motivation among the students of Catholic Mission Schools. Most of the students of CMS showed high achievement motivation.

Jayalekshmi (2000) conducted a study of achievement facilitating variables affecting the problem solving ability of girls in higher secondary schools of Kerala. The coefficient of correlation between achievement motivation and achievement was found to be significant for the total sample (r = 0.577), rural (r = 0.432), urban (r = 0.579), government (r = 0.527) and private (0.72). All these relationships were significant at 0.01 level.
Neeraj (2001) reported significant differences in vocational and academic streams between boys and girls in respect of achievement motivation. The high academic achievements of the academic group students have high achievement motivation whereas low academic achievements of the vocational group students have low achievement motivation. Achievement motivation was positively related with academic achievement.

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

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

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

Sharma (2006) studied the relationship of achievement motivation and academic achievement of Secondary School children. The study found that achievement motivation had no correlation with Achievement.

Tella (2007) examined the effect of achievement motivation on academic achievement and learning outcomes in mathematics in a sample of 450 (260 males and 190 females) secondary school students drawn from 10 schools in two local government areas in Ibadan, Nigeria. This investigator reported that students who had higher achievement motivation scored significantly high scores on a mathematics achievement test compared to their counterpart students with lower achievement motivation.

Adedeji (2007) Studied “The Impact of Motivation on Student’s Academic Achievement and Learning Outcomes in Mathematics among Secondary School Students in Nigeria” The result of the showed that secondary school students differ significantly in their academic achievement based on the extent to which they are motivated. The results revealed that highly motivated students performed better academically than the lowly motivated students.
Mahyuddin et al. (2009) studied with a sample of university students in Malaysia reported a significant and positive correlation between students’ achievement motivation and their academic achievement.

Bhatt (2009) examined the relationship of Academic Achievement of Secondary School Students in mathematics in relation to Intelligence, Achievement Motivation and Self Concept, and did not find any significant relationship between Achievement Motivation and Academic Achievement.

Study by Reynolds and Weigand (2010) found that academic motivation was not significantly correlated to academic achievement, as measured by the first semester Grade-Point-Average (GPA).

Awan et al. (2011) examined the achievement and its relationship with achievement motivation and self concept. The subjects consisted of 336 students (146 males and 172 females) from four public and four private schools of the Sargodha district at the secondary level. Intact groups of all eight schools enrolled in 9th grade were involved in the study. The results revealed that achievement motivation was significantly related to academic achievement.

Onete et al. (2012) examined the relationship between first year education students’ achievement motivation and their academic performance. The design employed for the study was survey (expo-facto). A total of seven hundred and fifty (750) out of one thousand three hundred and fifty two students (1352) students of the 2010/2011 academic session were randomly selected for the study. To guide the study, two hypotheses were formulated on students’ academic achievement motivation and academic performance as well as students’ social achievement motivation and academic performance. The results of the study after analysis of the hypotheses obtained data with “ANOVA” statistical analysis technique indicated that neither students’ academic achievement motivation nor students’ social achievement motivation had any significant influence on education students’ academic performance.

Rais Hasan et al. (2012) investigated the relationship between Academic Self-concept, Achievement Motivation and Academic Achievement among the a group of Iranian Students of Primary School. The results of study indicated that
is a positive relationship and Significant effect of achievement motivation on students achievement. The results indicated that the high achievement motivation students had, the better their academic achievement would be which shows that academic achievement motivation affect the academic achievement.

**Chow and Yong (2013)** investigated students' motivation and achievement in science. A sample of 324 Year 11 students from eight government secondary schools in Brunei Darussalam participated in the study. Of the sample, 141 were boys and 183 were girls and their average age was 16.4 years. Results demonstrate significant differences in motivational orientations towards learning-combined science between boys and girls and between high ability and low ability students. Furthermore, correlation analyses showed that there were significant positive associations between students' motivational orientations and science achievement.

**Azar (2013)** examined the relationship between academic Self efficacy, achievement motivation and academic procrastination with academic achievement and investigated predictive validity of them with academic achievement and interaction of them with gender to Academic achievement. To achieve this aim, samples of 200 (100 male and 100 female) students were selected by multi-stage cluster sampling from high schools of Orumieh. There was significant difference among boys and girls, in terms of the level of achievement motivation ($t=2.06$, $P=.04$), academic achievement ($t=.54$, $p=.000$) and academic self-efficacy ($t=094$, $P=0/01$).

After highlighting the accumulated fund of research work the stage was set for moving on to the chapter pertaining to **Plan and Procedure** of the Study.