CHAPTER – II
REVIEW OF RELATED LITERATURE

2.1 CONCEPT AND PURPOSE OF REVIEW

‘Review’ of ‘Literature’ means to look again or to organize the knowledge of specific area of research; and to involve an edifice of knowledge’ that would imply an addition to the corpus of knowledge in the concerned field; an inclusive investigation of a piece of research that reflects its own perspective in the light of its immediate significance; and its implications for the future.

Review of related literature thus means to locate, to read and to evaluate the past as well as current literature for the planned investigation. “Unlike other animals that must start a new with each generation, man builds upon the accumulated and recorded knowledge of the past” (Best, 1993). The meaning of this statement implies efforts on the part of researcher in locating, reading and evaluating the existing literature to pave way for building a sound foundation of one’s work in hand. “Literature in any field forms the foundation upon which all future work will be built. If we fail to build the foundation of knowledge provided by the review of literature, our work is likely to be shallow and naive and will often duplicate work that has already be done better by someone else” (Borg, 2007). "The survey of related literature may provide guiding, hypothesis suggestive methods of investigation and comprehensive data for interpretive purpose” (Goods, 1963).

2.1.1 Its Importance

Review of previous research in the associated area of investigation is extremely important to help an investigator in identify the problem, search for tools, design etc; invariably a wise step to minimize the risk of dead ends, wasteful efforts, understand the nature and magnitude of work done involved; and the direction in which to move to make a meaningful contribution in the concerned subjects.
2.1.2 Literature Reviewed

The reviewed literature comprises three sets, namely: (i) Multimedia and Academic achievement; (ii) Cognitive Styles and Academic Achievement; and (iii) Achievement Motivation and Academic Achievement.

2.2 STUDIES RELATED TO MULTIMEDIA AND ACADEMIC ACHIEVEMENT

Premila (2001), reporting the effect of a self-developed CD package of learning mathematics among high school students found computer multimedia teaching more effective than conventional teaching. Before using the package, 33.85% of the sample preferred mathematics as a subject and 40.63% preferred science; and after using the mathematics package, 53.85% preferred mathematics and only 24.62% preferred science subject, obviously, due to the impact of multimedia that may have created more interest among the students in selecting their subjects, and, also, indicating in turn, a significant change in their retention of learning and attitude towards mathematics.

Devi (2002), studying the effectiveness of a computer multimedia programme for teaching science to IX standard students found that learning through multimedia showed better performance than learning through traditional method of teaching; indicating high mean gain scores of low achievers of the experimental group than those of high achievers; confirming further that multimedia instructional methods do help slow learners to achieve better.

Chitlipuh (2004), in a study on the effectiveness of multimedia software programmes for online instruction and remediation in relation to cognitive style of high school students as compared to conventional instruction method found (a) the two instructional treatment strategies (MMO and CGL) not equal in respect of the gain means yielded by them; and (b) Multimedia online instruction resulted into higher gain means as compared to conventional group learning.

Desai (2004), using a self-developed multimedia package comprising transparencies, pie graph, charts, diagrams, pictures, video tapes, audio tapes, and slides to find out the efficacy of teaching through the traditional and multimedia approach in Home Science, found “mean achievement of the experimental group
significantly higher than that of the control group, with students preferring favourable opinions towards the multimedia approach”.

**Siskos and Antoniou (2005)**, using a self-developed interactive multimedia CD-ROM programme titled, “The Tree of Health” to explore the use of multimedia technology in the instruction, based on the premise whether Computer Assisted Instructions (CAI) in physical education is functional in school environment or not found that “the study analysis of covariance indicated a significant increase in post-test achievement for the (MCAI) group when compared to either the (TA) or the control groups. This intervention trial involved 12 fifth and sixth grade classes (N = 248 students), randomized into 3 groups: Multimedia Computer Assisted Instruction (MCAI), Traditional Approach to teaching (TA), and Control (C), tested using pre and post-tests that measured knowledge of ‘Health related fitness’ subjects; the experiment lasting 12 class hours, two classes per week over six weeks”.

**Karla and Randall (2006)**, investigating social studies achievement as a result of utilizing an interactive multimedia-based instructional software programme (Ignite Early American History, 2003) to augment textbook and lecture materials for seventh-grade middle school history students in an ethnically and linguistically diverse urban school district), designed to teach through video, song, animation, text, and other media to develop critical thinking skills while acquiring knowledge of required content strands (Ignite Learning, 2003), found that both the students, that is, those who used American history software, as well as those who did not, increased their test scores from pretest to posttest conditions.

**Sunder (2006)**, in a study on effect of computer based multimedia instructional strategy on achievement in English language in relation to anxiety and parent-child relationship, vis-à-vis the traditional methods on use of grammar in English language, observed that (a) significant relationship was found in achievement of students in English language between the groups with regard to methods of teaching with the mean scores of group I (taught via computer based multimedia instructional strategy) higher than group II (taught via grammar-based strategy); and (b) Computer based multimedia instructional strategy using CD-ROM was found slightly better than traditional methods of verbalism and print media.
Sangeetha Ramasamy (2007), in a study based on a self-developed multimedia package for the teaching of history to secondary level students as against the over conventional method, found multimedia package most effective in learning history since it integrates the elements like text, still and motion pictures, animation and audio as compared with conventional teaching, indicating further that multimedia has tremendous impact upon enhancing the achievement of secondary level history students. The study was conducted for four groups in two phases. Among the total 175 samples boys (N=90), girls (N=85), the 't' value for pre and post of the experimental group was 20.55 and the highest gain score was obtained by the fourth group, the so-called multimedia group.

Benjamin and Sivakumar (2008), found the “Interactive Multimedia CD based learning in Physics” to be more than effective over the conventional method of instruction.

Kim & Gilman (2008), investigating the use of multimedia components such as visual text, graphics and spoken text in a Web-based self-instruction program to increase learners’ English vocabulary learning at Myungin Middle School in Seoul, South Korea on a total of 172 middle school sample students (14 years of age) in five classes found that “the participants learned better when they received visual text and added graphics or visual text, added spoken text, and added graphics instruction”.

Acha (2009), in a study, “The effectiveness of multimedia programmes in children's vocabulary learning”, investigating the effect of three different presentation modes on children's vocabulary learning with a self-guided multimedia programme tried on 135 (3rd) and (4th) grade students showing them a short English language story, presented on a computer programme with twelve previously unknown words (key words) embedded within the story, and presented with verbal annotations (written translation), visual annotations (picture representation), and a combination of the two to assist in their understanding of the twelve key words found that ‘Recall’ of word translations was the highest for students who received verbal annotations only; suggesting thereby a challenge for effectiveness of the self-learning multimedia programme in second language vocabulary acquisition.
**Wu & Yang (2009)**, exploring the impact of Digital Storytelling (DST) on the critical thinking (CT), problem solving (PS), and academic achievement of senior high school students, based on a quasi-experimental design with 113 (10th grade) students in two classes with an independent variable of instructional strategy with two levels—information technology integrated learning and DST; and dependent variables students' CT, PS, and academic achievement, found a significant improvement in students' CT, PS, and academic achievement on DST instructional strategies.

**Tan et al. (2010)**, assessing the impact of incorporating authentic learning principles into a web-based multimedia learning module, and embedding it within a student-centred learning environment, presented in a multimedia-mediated web-based learning module, developed within the curriculum of the class, and their feedback solicited, found that “students were very positive towards the incorporation of interactive authentic activities, finding the authentic learning environment very relevant to their learning that made them more engaged and actively involved in the learning process. The results showed strong and encouraging support for the development of multimedia web-based modules grounded in authentic learning and sound design principles besides an innovative teaching and learning strategy in a technology-backed class”.

**Adegoke (2011)**, examining the effect of multimedia instruction on cognitive achievement of senior secondary school students in physics, on a sample of 198 (106 male and 92 female) in three experimental groups and a control group showed that, “on an average, students in the animation + on – screen text + narration group took best quality notes which seemed to have influenced their superior cognitive achievement in physics. Generally, students under multimedia instruction performed better than their colleagues in the lecture group. Three courseware versions namely, animation + on – screen text, animation + narration, animation + on – screen text + narration were developed to examine the interface effects.” These findings suggest that learning outcomes of students in physics can be enhanced with multimedia instruction.
Vivien et al. (2011), investigating a meta-analysis on “Are Multimedia resources effective in Life science Education?”, found multimedia learning more effective than many traditional educational methods.

Aloraini (2012), in a study on the impact of using multimedia on students’ academic achievement, in an experimental situation, found that “the post-test showed statistically significant difference between the experimental and control groups at a 0.05 level of significance to the benefit of the experimental group”. The first group used a computer-based multimedia presentation programme, while the second group was given same lecture using the traditional method, using dialogue and discussion technique. Both groups were subjected to pre-test and post-test in the subject tackled by the lecture.

Baranisree (2012), in a study on “Effectiveness of Video based programme in teaching grammar for VII standard Students”, conducted on a sample of 100 students using a package of video based programme on articles and adjectives to teach grammar, found that the academic achievement of the students taught through Video programme proved to be higher than those taught through traditional method.

Nazir, Rizvi, and Pujeri (2012), showed that: (a) the multimedia-based instructional format helps in better understanding, provide innovative teaching methodology, give good opportunity for interaction and help in making discussion in a self-controlled way; (b) five factors namely, Ease of Learning (EOL), Ease of Understanding (EOU), Increased Interactivity (II), Confidence (C), and Amended Attentiveness (AA) could play an important and significant role in the development of the skill of the learners (EOSD); and (c) after acquiring expertise through following the channel give way to overall confidence in learning the subject.

Sahni and Sharma (2012), studying the effectiveness of multimedia over the conventional method in teaching bloom’s taxonomy to distance mode teacher trainees on a sample of 124 B.Ed. trainees (distance mode) tested through a self-developed criterion test on Bloom’s taxonomy. Data analysis involved the use of two way ANOVA (2 × 2 factorial design) and t-test which indicated that: (a) the teacher trainees when exposed to multimedia programme yielded better learning and retention as compared to those taught through conventional method of teaching; and (b)
multimedia proved to be more effective for low achievers as compared to high achievers teacher trainees.

**Danebeth (2013)**, investigating the effect of multi-media instruction in improving student learning by involving forty-eight students enrolled in World Literature course used as subjects of the study showed that: (a) the students who were exposed to multi-media instruction had enhanced academic performance in the said course; and (b) the students who had multi-media instruction, executed better learning than students taught in the traditional teaching method. Multi-media instruction was followed in the experimental group while the traditional teaching method was used in the control group, following a quasi-experimental design. The pre-test mean scores identified the primary knowledge of the participants; and conducting the selected topics using multi-media instruction, the students were given a post-test.

**Kumar & Patil (2013)**, in a study on effectiveness of multimedia presentation for teaching English Grammar to government rural secondary school students found that “the students of experimental group, exposed to Multimedia presentation, gained much higher scores in their particular topics taken for teaching English than students of the control group”. The sample was divided homogeneously into control group and experimental group. The control group was treated by traditional method and the experimental group was treated by multimedia presentation. The difference between pre-test and post-test scores of both the groups was calculated and mean difference of the groups was studied.

**Sharma (2013)**, comparing the effectiveness of interactive multimedia and conventional direct method of teaching English in relation to students’ achievement and retention on a sample of 100 students of class VII aged 12-14 years (50 students in experimental group and 50 students in control group). The experimental group was taught through the interactive multimedia and control group was taught through the conventional direct method. It was found that “through both the method are quite effective for teaching English language to class VII students, yet the interactive multimedia method proved to be more suitable with respect to the marks achieved by them in English”.

Ercan, Orhan (2014), implementing a self-developed multi-media learning material for 5th grade science course on "Food and Healthy Nutrition" and examining its effect on a convenience sample of 62 students in terms to their academic achievement and science attitudes found: (a) a statistically significant difference between post-test achievement scores of the experimental and control groups, with the experimental group scoring higher; (b) a statically significant difference between students' post-test scores in terms of gender, favouring females over males; (c) in terms of science attitude also a significant difference between post-test scores of the experimental and control groups; and (d) multimedia learning promoted more effective learning in science education. The study used a control group, a pre-test-post-test quasi-experimental research design. The research instruments used were an achievement test and a science attitude scale. During the implementation process, the experiment group learned using multimedia learning material and the control group the traditional methods. Data were analyzed using an independent-samples ‘t’ test, a paired-samples t-test, and AN-COVA statistics.

Gambari et al. (2014), examining the effects of video-based multimedia instruction on a random sample of 120 biology students (60 male and 60 female) assigned either into one of three experimental groups: Animation + Narration; Animation + On-screen Text; and Animation + Narration + On-screen Text or a control group showed that “students under multimedia instruction performed better than their peers in the conventional teaching method”. The pre-test, post-test control group design was adopted; and a 50-item multiple-choice objective test termed Biology Achievement Test (BAT) was used for collecting data.

Kim, Cho, & Lee (2014), exploring the effect of multimedia-based self-directed speaking practice for English learning at a university setting in Korea showed that “only 17 out of 43 learners (39.54%) successfully moved up to a higher level of English speaking ability as a result of self-directed speaking practice. Three variables were tested for their possible association with speaking ability improvement: practice quantity, practice quality, and learner quality. Two-by-two Chi-square analyses revealed that none of the variables was significantly associated with speaking level improvement, even though there were more learners who improved their speaking
ability in the high groups. Finally, survey data indicated that learners perceived the programme and their experience as positive, yet their actual participation level was relatively low”. A key implication is that self-directed speaking practice requires sophisticated training and coaching to create adequate motivation and readiness for independent learning.

Owolabi and Oginni (2014), investigating the effect of animation and multimedia teaching on academic performance of students in sciences on a sample of 100 students, randomly selected from four secondary schools in Ado Ekiti Local Government Area of Ekiti State using the quasi-experimental research design showed a significant improvement in the performance of students exposed to cartoon style multimedia teaching than those who were conventionally taught. The pre-test and post-test scores of the students in the conventional and multimedia teaching group were used for the purpose of data analysis using t-test.

Kaur, Sharma, and Singh (2015), in order to find out the effectiveness of a self-developed multimedia-package on the academic achievement of class 8th students in English of Tagore Model School found the multimedia package to be more effective for academic achievement of class students. The data was collected by using an appropriate tool and analyzed by ‘t’ test. Pre-test-post-test experimental control group design was followed and Means, S.D.s and t-test were used to analyze the data.

Nozari & Siamian (2015), aiming to address whether utilizing podcast multimedia training system has an effect on the motivational achievement and students learning of the Arabic course in high school in a practical-purposed, descriptive and quasi-experimental study, pre- and post-test method in control and experiment groups and, simple random sampling method form the groups. The results showed that teaching with podcast multimedia systems significantly increased learning of Arabic at high school level, while motivation reinforcement between traditional method and multimedia podcasts system had no significant differences. The data distribution was normal. Significant differences between experimental and control groups in terms of academic level were not observed in the pre-test. There was also no significant difference between the motivational achievement of education in post-test of control and experiment group.
Ilhan, and Oruç (2016), examining the effect of multimedia on the academic success of social studies students in an experimental design situation with two sections (both 4th grade – Section I as the control group and Section II as the experimental group) on a sample of 67 students in Kayseri, Turkey found that multimedia technique increased the academic success of students in social studies lesson compared to the traditional classroom. For data collection, an achievement test, generated with experts’ opinion and tried as pilot was used. Data from achievement test was analyzed with SPSS program.

Cho (2017), examining the effects of multimedia enhancement in video form in addition to textual information on L2 vocabulary instruction for high-level, low frequency English words among Korean learners of English. It was found that multimedia presentation has a greater positive effect on learning than text-only presentation, supporting the dual-coding theory. Among the types of multimedia support, Text+Audio+Video appears to be better than Text+Audio or Text+Video, suggesting the benefit of the combination of audio and video. More, multimedia audio-visual support was found to be more advantageous when supplemented with a linguistic cue in the form of a precise definition or synonym of an unknown word. Findings have both theoretical and pedagogical implications in L2 vocabulary acquisition of high-level, low-frequency English words in that the study addressed ways to design effective multimedia materials and offered instructional guidelines for multimedia language teaching.

2.3 STUDIES RELATED TO COGNITIVE STYLES AND ACADEMIC ACHIEVEMENT

Shih and Gamon (2001), testing the relationships between student achievement, motivation, and cognitive styles among 99 students taking two web-based courses, showed that; “two-thirds of the students were field-independent learners; no significant differences in achievement between field-dependent and field independent students; and students with different learning styles and backgrounds learned equally well in web-based courses”.

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Banerjee and Debasri (2003), studying adjustment patterns and cognitive style of students having low and high creativity to explore the relationship between cognitive style and creativity, and between adjustment and cognitive style found “a significant correlation between creativity and cognitive style; but no significant difference in the cognitive style of VII and VIII grade students; cognitive style and adjustment patterns revealed no difference due to grades; while field independent students made better adjustment in home and school area”.

Alomyan (2004), investing the effect of cognitive styles, achievement motivation, attitude on achievement and prior knowledge in a web-based environment, found no significant difference in attitude of students towards web-based learning and their field dependencies.

Geetanjali (2006), studying academic achievement in relation to cognitive style and hemispheric style at secondary stage, found that “cognitive style had a significant effect on students’ achievement; more the field independence of students, higher the academic achievement”.

Salmani-Nodoushan (2006), investigating field dependence/independence as two factors other than language proficiency that may be responsible for systematic variance in language performance, with the hypothesis that field dependence/independence would introduce significant variance into Iranian EFL learners’ Communicative Test (CT) found that field dependent (FD) participants, as compared to their field independent counterparts, performed much better on both (CT and IELTS); and they were better performers on communicative tests which did not have a discrete-point nature.

Jantan, & Masran (2007), examining the relationship between students’ mathematics achievement with teachers’ teaching style and students’ cognitive style. The study was carried out on a sample of 395 students (class 3-6) with their 13 Mathematic teachers, using GEFT (Group Embedded Figures Test) to identify students cognitive style either field-dependent (FD) or field-independent (FI); and ‘Teaching Style Inventory’ adapted from Grasha (1996) to identify teachers’ teaching styles, found that “there was a positive and significant correlation between teachers’ teaching style and students’ cognitive style with their mathematic achievement.
Coefficient correlation showed that the effect of teachers’ teaching had greater influence than students’ cognitive styles on their mathematic achievement”.

Theen & Abdullah (2008), examining the effect of gender, ethnicity and cognitive styles on achievement of form six students in General Paper on a sample of 152 (60 male and 92 female) from a selected school in Perak using GEFT test (Group Embedded Figures Test) used to measure students’ cognitive styles, with 69 (45.39%) students were from field-dependent cognitive style and 83 (54.61%) students from field-independent cognitive style found that “girls’ achievement was significantly higher than that of boys; ANOVA showing that Chinese students scored significantly higher than Malays and Indians; and positive correlation between students’ cognitive style and achievement in this study”.

Behnam and Fathi (2009), in order to determine whether there is a significant relationship between the reading performance and field dependence/independence cognitive styles of 60 intermediate level EFL Iranian learners of English as a foreign language, both male and female selected through a placement test and subsequently determining their cognitive styles using the Group Embedded Figures Test (GEFT); and their performance on a reading comprehension test indicated that “field independent participants had an advantage over field dependent ones, and females outperformed their male counterparts both on GEFT test and the reading comprehension test. To test the claim that there is a significant relationship between field dependence/field independence styles and their performance on the reading test, a correlation was run between the two sets of scores”.

Suh (2009), confirming the relation between field independent and field dependent cognitive style and the English reading ability of Korean college students, found that field dependent learners achieve lesser than the field independent students on reading tests.

Yousefi (2011), investigating the relationship between Iranian listening comprehension ability and cognitive style of 131 participants showed “a statistically significant difference between FD and FI learners’ performance on listening tests, with the FD style showing a relatively facilitative effect on this skill”.

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Chen and Liu (2012), exploring the effectiveness of using learner-generated and instructor-provided multimedia annotations on foreign language reading comprehension and attitudes found that: “first, for reading comprehension, the learner-generated annotation group performed better than the instructor-provided group, no matter which cognitive learning style they were. Second, higher-level learners with learner-generated annotation performed better than those with instructor provided annotation. However, the difference between lower-level learners with learner-generated annotation and those with instructor-provided annotation was not significant. Finally, learners had positive attitude toward multimedia annotation use and thought text annotation was the most useful of the different types”.

Khodadady and Zeynali (2012), exploring the relationship between field-independence/dependence cognitive style and listening comprehension ability of English students enrolled in universities and language institutes in Mashhad, who responded to the Group Embedded Figures Test (GEFT) and the IELTS listening comprehension divided into field-dependent and field-independent groups according to the scores gained in the GEFT suggested that “test-takers’ cognitive styles influences on their listening and task performance. Field-independent participants outperformed field-dependent participants in IELTS listening comprehension and all of the listening tasks; and also that field-independency correlates more positively with test-takers successes in IELTS listening comprehension compared to field-dependent ones; more specifically, field-independency correlates more significantly with fill-in-the-gap questions, i.e., form-completion, note-completion and sentence-completion tasks compared to field-dependent test-takers. Field-dependency cognitive style, however, correlates more significantly with multiple choice and matching questions compared to field-independency cognitive style”.

Nezhad and Shokrpour (2012), exploring the impact of static versus dynamic task type and the possible interaction with field dependence/independence cognitive style on learning English vocabulary among intermediate EFL learners on a sample of Eighty four female EFL learners studying at the BS level at the University of Social Welfare and Rehabilitation Sciences aged 19-25 were randomly selected and given a Cognitive Style Test and a Nelson Proficiency Test (2000 A) to be assigned to
either of the control and experimental groups matched for their vocabulary knowledge and cognitive style showed that vocabulary instruction led to favourable results among field-dependent learners taught by the dynamic task type technique and poorest performance in field-dependent students exposed to the static task type technique while field-independent learners better performed through the static task-type technique. Task type significantly influences vocabulary learning and may marginally affect reading comprehension performance. Although the two groups were exposed to identical reading passages during classes held twice a week in the four-month treatment period, the control group received vocabulary instruction through static task type technique based on the traditional approach to teaching vocabulary while the experimental group underwent dynamic task type technique. The Nelson Proficiency Test was once more used as the post-test to show the differences in vocabulary gain in the two groups. The collected data were analyzed through ANOVA using SPSS software.

Vijayalaxmi and Kadapatti (2012), aiming to know the Influence of cognitive style on scholastic performance of school age children on a sample of 50 children each from private schools and 50 children from corporation schools of Bangalore city found that majority of the private school field independents, had high scholastic performance in contrast majority to those in corporation schools who were found to be field dependent; also that higher the cognitive style scores, better the scholastic performance, as scholastic performance was found to be significantly associated with type of school. Standardized tools were used to measure field dependence and independence and scholastic performance.

Wang (2012), comparing the effect of inductive and deductive approaches in teaching English verb tenses to Taiwanese English-majored freshmen of field independent/dependent (FI/FD) cognitive styles found that “both approaches were effective, and the deductive group had more significant improvement; both FI and FD students improved significantly; FD student improvement was especially evident; FD students in both groups improved more than FI students, but the difference was not significant”. Students’ cognitive styles were tested by Group Embedded Figure Test. To realize student learning outcomes, a self-designed test was conducted.
Chang, Weng, and Zakharova (2013), investigating the use of vocabulary learning strategies (VLSs) among EFL junior high school students in Taiwan, and exploring the relationship between the use of VLSs and cognitive styles showed that students do not often use VLSs; cognitive style is significantly correlated with the use of the following 3 VLS categories: social strategies, memory strategies, and metacognitive strategies—but not cognitive strategies; suggesting that teachers help students understand various VLSs and their cognitive styles to improve and facilitate their learning. Tools used and administered included VLS questionnaire and a Hidden Figures Test (HFT) to 277 Grade 9 junior high school students.

Karamaerouz, Abdi and Laei (2013), examining academic achievement in English both for field dependence and field independence learning styles using educational multimedia on a sample of 40 second-grade female students of secondary school in Kermanshah. The instrument used in the study was The Group Embedded Figures Test (GEFT) and a teacher made English test. Results which were analyzed by t-test indicated that instruction based on field dependence style with using multimedia were more effective in improving students’ creative thinking performance than field independence; also in field dependence style students will have a better memory to memorize verbal information, whereas in field independence students act analytically toward the main subject materials; in field dependence style students have a higher interest in continuing their study than in field independent style; as a result they are more successful in utilizing what environment according to their needs.

Adibifar and Nostratinia (2014), investigating the effect of metacognitive strategy instruction on the writing performance of field-dependent and field-independent intermediate learners revealed that the experimental group did statistically better in their post-test; while field-independent learners outperformed field-dependent in their post-test. Sixty two male and female intermediate EFL learners age range of 18-35 years, were selected as homogeneous learners and were given Group Embedded Figures Test (GEFT) in order to be characterized as either field-dependent or field-independent. Then, they were divided into two groups of experimental and control and both took a pre-test of writing. The experimental group received metacognitive strategy training, while the control group received the usual
teaching programme of the language school. At the end of the training, a writing post-test was administered to both the groups.

**Farsi et al. (2014)**, aiming at the influence of field dependent-independent (FD/FI) on proficiency test indicated that there was a positive relationship between FI and language proficiency of the participants. The cognitive style (FD/FI) was considered as an independent variable and proficiency test as the dependent variable. Eighty-six freshman female students of English as a foreign language (EFL) at Kerman University, Iran participated in the study. At first, the Group Embedded Figures Test (GEFT, Witkin et al., 1971) was given to the participants in order to identify field dependent/independent groups. Then, the participants were given a proficiency test.

**Fatemi and Vahedi (2014)**, exploring the effects of top-down/bottom-up processing and field-dependent/field-independent cognitive style on Iranian EFL learners’ reading comprehension revealed that “FI learners outperform their FD counterparts in bottom-up group; FD learners were more successful than FI ones when taught through top-down reading instruction model. It was attempted to find first, whether FI learners would perform better when taught through top-down or bottom-up reading instruction model; secondly, whether FD learners would perform better when taught through top-down or bottom-up reading instruction model. Two intact classes including 40 Iranian freshmen EFL students with the same level of reading proficiency tested through reading section of TOEFL test participated in this study. One class was randomly assigned to top-down reading instruction model and the other to bottom-up approach”.

**Mehragangar and Dowlatabadi (2014)**, investigating the correlation between field-dependence and field-independence cognitive style and vocabulary learning strategies among Iranian EFL learners showed that “there was a causal correlation between field-dependent/independent cognitive style and vocabulary learning strategies; field-dependent learners tended to use social strategies more than field-independent individuals; and the field-independent learners used cognitive and metacognitive strategies more frequently than field-dependent counterparts”. The participants were classified into two groups of field-dependent and independent based
on the results of Group Embedded Figure Test (GEFT). Then, a vocabulary learning strategy questionnaire (Schmitt, 2000) was administered. The data was analyzed through structural equation modeling (SEM) statistical analysis.

Onyekuru (2015), investigating the relationships among field-dependence-field-independence cognitive style and gender, academic achievement and career choice of students at secondary level found that: “a higher proportion of the male respondents were field independent while a higher proportion of the female respondents were field dependent; there was a significant relationship between field dependence-field independence cognitive style and gender; field independent students had a higher mean achievement in sciences than the field dependent students while field dependent students had a higher mean achievement in arts than the field independent students; there was a significant relationship between field dependence-field independence cognitive style and career choice of the students”.

Punaji, Dedi and Dwiyogo, (2016), analyzing the effect of learning strategies (The differences between Problem Based Learning and Direct Instruction) and cognitive style on mathematical problems solving learning outcomes, showed that: (1) there is a difference in learning achievement between the students’ groups who are taught by PBL and direct learning; (2) there are differences in achieving learning outcomes toward students’ group and different cognitive styles; and (3) there are significant interactions between the use of learning strategies and cognitive style on learning outcomes. The study used a quasi-experimental research design (nonequivalent control group design), and research subjects were students from state elementary school of V grade in Gading I Surabaya, east java. The data collection techniques used included mathematical problems solving learning pre-tests and post-test, Group embedded figures test (GEFT) for cognitive style, assessment performance for learning achievement. Data analysis techniques used was ANOVA technique (analysis of variance) two lines.

Sajadi (2016), examining the effect of field dependent-field independent and gender on Iranian EFL Learners' English Success on a sample of 112 male and female students of English as a foreign language (TEFL) from Farhangian and Shohadaye Farhangi High Schools, in Arak indicated that “there was a positive relationship
between learning styles and English learning success of the participants; based on statistical results, there was no significant correlation between the subjects' gender and their English learning success, that is, Iranian female learners performed the same as Iranian male learners in English achievement test”.

**Sara, Maruta and Olarinoye (2016)**, to determine the relationship between cognitive styles, and achievement in science process skill among senior secondary school biology students in Jigawa State revealed that: cognitive styles of field dependence, field-independence and field Neutral were significantly related to achievement in science process skills; in that efforts should be made to improve secondary schools students cognition by teachers by employing variety of learning content presentation methods. Three objectives of the study and three hypotheses were stated. Correlation survey was employed as the design for the study. Two instruments were used for data collection: Group embedded figure test (GEFT) and the biology Science process skills achievement test BSPSAT). Two hundred sixteen students selected by proportionate random sampling were used as subjects for the study.

**Ramlah et al. (2017)**, identifying the students’ cognitive style to find the relationship between students’ cognitive style and their reading ability in Malay Language on a sample of 130 students (65 boys, 65 girls) from selected primary schools in Malaysia showed that there were more participants with Field Independent cognitive style (97 students) than Field dependent (33 students); there was a positive correlation between cognitive style and reading ability; in that teachers should be cautioned that students differ in their way of perceiving and obtaining information; and teachers should understand the students’ way of perceiving information and prepare their teaching approach and activity suitable with their preferences; and teachers should be creative in diversifying education techniques in class by being sensitive with students’ learning needs. The participants were selected from standard 4 and 5 (10-11 years old). Methodology of study was survey using questionnaire to collect data. In data collection, three instruments were used namely revised ‘Group Embedded Figures Tests’ (GEFT), demographic questionnaire and reading test. From data collected, researchers were able to identify student's cognitive style either Field
Independent’ (FI) or ‘Field Dependent'(FD). Data were analyzed using descriptive and inferential statistics.

Singh (2017), exploring the effect of learning style and cognitive styles on learning and achievement of learners indicating that “there is a link between cognitive style and learning style which also determines the achievement of learners; the learners having field dependent and field independent (cognitive style) have different learning styles”. Since, the learners differ in their cognitive style; therefore if an attempt is made to identify them will improve the learning.

2.4 STUDIES RELATED TO ACHIEVEMENT MOTIVATION AND ACADEMIC ACHIEVEMENT

Abdullahi (2000), examining the relationship among achievement motivation, locus of control, self-esteem and academic performance of university students on a sample of 1335 boy and girl university students selected on the basis of simple random sampling method. On the basis of multiple regression analysis it is revealed that “the subjective independent variables did not predict objective measure of the students’ academic performance. Psycho-sociological evidences abound that lack of achievement motivation and low self-esteem creates in students lack of interest to strive for high academic performances, and zeal to contribute positively and efficiently to national development”.

Krishnamoorthy (2003), studying the relationship between achievement motivation and achievement stated that achievement motivation and academic achievement have a significant positive relationship.

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

Singh and Kaur (2003), in a study of achievement motivation and parental background as a determinant of students’ academic achievement found that there was a positive correlation between achievement motivation and academic achievement of
students; while qualification of parents and working of parents have a significant effect on students’ achievement motivation and academic achievement.

Manimekalai, Selvam and William (2005), investigating the effect of achievement motivation on scholastic achievement among the plus two girls on a sample of 100 boys and 350 boys girls of three government and three private higher secondary schools was taken from Kumbakonam, Thanjavur District of Tamilnadu showed a positive relationship between achievement motivation and scholastic achievement of girls and girls of private schools had more achievement motivation than girls of government schools and had more scholastic achievement too. Cluster sampling technique was used for the selection of sample.

Bansal et al. (2006), exploring the relationship between achievement motivation, locus of control and quality of home environment among high and low achiever students found that there is a significant positive relationship between achievement motivation and intrinsic locus of control, while high achiever students found to have good quality of home environment and had a significant relationship with achievement motivation and academic achievement.

Ruhland et al., (2007), investigating the role conflict and its relationship to achievement motivation and academic performance concluded that “there is a significant relationship between achievement motivation and academic performance and the students who are in higher classes has a bit of role conflict; high level of motivation have greater effect on students’ performance and it raise the level of students’ performance than the students who have less achievement motivation”.

Van de Gaer, Eva; et al (2007), investigating the impact of students’ achievement motivation on the status and growth in Mathematics and Language. Achievement of boys and girls across seventh and eighth grade found the positive effect of achievement motivation both individually and in group on their achievement.

Pandey and Faiz Ahmed (2008), investigating the significance of difference in achievement motivation, academic performance, intelligence and socio-economic status among male and female adolescents studying in XI class found no significant difference among male and female adolescents on measures of achievement motivation, academic performance, intelligence and socio-economic status.
Alam (2009), in a study of relationship between academic achievement, creativity and academic achievement motivation indicated the significant relationship of academic achievement with creativity and achievement motivation of the students; while creativity has significant positive relationship with academic achievement for the total sample boys, girls, urban and rural students; in case of achievement motivation and academic achievement of the students, the coefficients of correlation for the total and sub-samples are again significant and positive; the significant positive relationship shows that academic achievement increases with achievement motivation and vice-versa. A sample of the students of class X drawn from different government schools of Darbhanga district in Bihar age ranged from 15 to 16 years. Only the government schools were surveyed for the sake of similarity in infrastructure and educational environment of the students. Creativity Test by Mehdi, Achievement Motivation Scale by Beena Shah was taken as tools. Aggregate marks of the annual examination were collected from official records of schools.

Umadevi (2009), examining the relationship among achievement motivation, emotional intelligence and academic achievement of student-teachers of primary schools studying in various colleges of Davangere city in Karnataka found a significant relationship between achievement motivation and academic achievement of student-teachers. Further a significant and positive relationship was found between achievement motivation and emotional intelligence. Achievement motivation test by Bhargava was taken to assess the achievement motivation of student-teachers.

Bakar et al. (2010), studying the relationship between achievement motivation, academic performance and attitude on a sample of 1484 students of science, education, humanities, technical/agriculture/engineering programmes found a significant positive relationship between achievement motivation and students’ attitude towards learning and between academic achievement and students’ attitude. However, negative and low relationship was found between achievement motivation and students’ academic achievement. Self-reported questionnaire was adopted in this study and cluster sampling technique was used to collect the sample.

Awan et al. (2011), examining the relationship of academic achievement with achievement motivation and self-concept on a sample of 318 students (172 females
and 146 males) of secondary level revealed that achievement motivation and self-concept had significant relationship with academic achievement; female students were found to have more academic achievement than their counterpart male students.

**Bakhtiarvand et al. (2011),** studying the role of achievement motivation on relationship between academic achievement and learning approaches on a sample of 200 (100 female and 100 male) college students by using simple random sampling method revealed that achievement motivation moderated relationship between academic achievement and learning approaches significantly; and achievement motivation affect the selection of learning approaches also have a significant impact on students’ academic achievement. Achievement Motivation Test and Learning Approaches questionnaire were administered and academic averages of students were considered as academic achievement.

**Yusuf (2011),** examining the impact of achievement motivation, self-efficacy, and self learning strategies on students’ academic achievement indicated that achievement motivation, self-efficacy beliefs, and self learning strategies have a significant effect on academic achievement.

**Abuameerh and Saudi (2012),** aiming at discovering, the relationship between achievement motivation and secondary school students’ achievement in Salt city in Jordan on a sample of 441 students (231 females and 210 males) found that “student’s achievement motivation was high with regard to the major dimensions taken by this study; which are students’ having a goal to achieve and persistence; the study further revealed student’s motivation towards the dimension of “ambition” was weak; and there were significant differences in students' achievement motivation due to academic achievement; students who passed showed more motivation rather than students who failed while there were no significant differences in students’ achievement motivation due to sex”.

**Bandhana and Sharma (2012),** investigating the impact of achievement motivation, study habits and academic achievement in a ninth grade high school on a sample of 250 participants (132 females and 118 males) revealed that good study habits students have higher level of academic achievement in comparison to the ones with poor study habits; boys are having better study habits in comparison to girls; and
students with high achievement motivation have better academic achievement in comparison to students with low achievement motivation; and male students were found to have better academic achievement in comparison to female students. Deo-Mohan Achievement Motivation Scale and Palsane and Sharma’s Study Habit Inventory were used to collect the data. Mean, SD and Three-Way ANOVA (2×2×2) factorial experiment were used to analyze the data.

Shekhar and Devi (2012), in a study of achievement motivation across gender and different academic majors pointed out that “Achievement motivation is considered a prerequisite for success in academic settings”. The study was carried out with the objectives to investigate the gender related differences and differences across academic majors on achievement motivation among college students. A sample of 80 male and female undergraduate students of arts and science stream of different colleges from Jammu selected on the basis of purposive sampling method. The study further revealed that “female and science stream students were found to have high achievement motivation in comparison to male and arts stream students”.

Akpan and Umobong (2013), examining the effect of achievement motivation on students’ academic engagement on a sample of 540 senior secondary school students indicated that achievement motivation has a significant influence on students’ academic engagement. Highly motivated students were found more academic engaged that the students having low achievement motivation. Male students were found more motivated than female students; age also had a significant impact on achievement motivation.

Firouzeh Sepehrian Azar (2013) investigating the relationship between achievement motivation, self efficacy, academic procrastination and academic achievement in pre-college students found that academic achievement had a positive significant relationship with achievement motivation, self efficacy, while negative relationship was found between academic achievement and academic procrastination. A significant difference was found between male and female students in relation to achievement motivation, self-efficacy and academic procrastination.

Kaur (2013), studying the academic achievement of college students having high and low achievement motivation on a sample of 100 college students of Patiala
district of Punjab indicated that the students having high achievement motivation were better in academic achievement than the students having low achievement motivation. The research tools used were Personal Data Form and Deo-Mohan Achievement Motivation Scale by Deo-Mohan (2002).

**Emmanuel (2014),** investigating relationship between achievement motivation academic self-concept and academic achievement of high school students found that, “majority of the high school students who were highly motivated, have high self-concept and performed well on the Achievement test; a significant correlation between self-concept and academic achievement was also found; and there was a positive relationship between achievement motivation and academic achievement. The study also confirms the importance of achievement motivation and academic self-concept to academic achievement”.

**Chetri (2014),** examining adolescents’ achievement motivation and its relationship with academic achievement among 480 secondary school leavers studying in different schools of Sikkim selected through stratified Random Sampling Method from various government and non-government schools from rural and urban areas, found no significant difference in achievement motivation in relation to sex and locality; but significant difference in academic achievement was found in relation to locality and management variation; a significant relationship was also found between achievement motivation and academic achievement.

**Gupta (2014),** exploring whether various social categories of school going adolescents differ with respect to self-concept, academic achievement and achievement motivation on a sample of 846 students from 28 schools of West Bengal, chosen by SRSWOR by the sampling scheme of Rao, Hartley and Cochran (1962) revealed that gender difference was significant for four dimensions of self-concept out of six dimensions considered; for academic achievement and achievement motivation, gender difference was not found to be significant; and highly significant differences were observed for academic achievement and achievement motivation but insignificant difference with respect to dimensions of self-concept. To test hypothesis of simultaneous equality of a set of variables such as self-concept, academic
achievement and achievement motivation across the social categories, ANOVA was undertaken.

**Yazdani and Godbole (2014)**, studying the relationship of academic performance with achievement motivation and study habits of 400 male and female students studying in 7th and 8th classes revealed that achievement motivation and study habits have significant and positive correlation with academic achievement. Therefore, it can be said that achievement motivation and study habits play a major role on students’ academic performance and help them to perform better academically. Study Habits Inventory by Palsane and Achievement Motivation Scale by Deo-Mohan were used to collect the data. Mean, SD and Karl Pearson’s Product Moment Coefficient Correlation were used to analyze the data.

**Abubakar (2015)**, examining the relationships between achievement motivation, parental expectation and academic performance of senior secondary school students in Sokoto Metropolis, a purposive selection of eight secondary schools was made, while proportionate sampling technique was used to select 341 students, who fill the four instruments used to generate data from the students indicated that, there was a significant relationship between students’ achievement motivation and their academic performance; a relationship was found between students’ achievement motivation and parental expectation; while the regression analysis indicated that, parental expectation is a better predictor to students’ academic performance than achievement motivation. Four hypotheses were generated and tested using Pearson Product Moment Correlation and Multiple Regression Analysis.

**Bansal & Pahwa (2015)**, examining the influence of School related Hardiness and achievement motivation on academic achievement of secondary school students indicated statistically significant interaction at .05 level between school related hardiness and achievement motivation with regard to academic achievement. Descriptive survey method was employed to conduct it. Statistical techniques of product moment method of correlation and analysis of variance were employed to analyze data. There was no significant relationship found between Academic Achievement and school related Hardiness but a significant relationship was found between Academic Achievement and Achievement Motivation. Significant main
effect of Achievement Motivation was revealed on the Academic Achievement of students at .05 level but there was no significant main effect of school related Hardiness on Academic Achievement. Overall, these findings provide new insights about a comprehensive understanding of school related hardiness and achievement motivation as correlates of academic achievement.

Kumar (2015), conducting a study on the sample of 300 students showed that F ratios were significant for the main effects of Intelligence (I) and Achievement Motivation (A), and also for the double interaction effects of Intelligence (I) * Achievement Motivation (A). As per the requirements of 2×2 factorial design in which the independent variables of Intelligence and Achievement Motivation were studied. Academic Achievement was taken as a dependent variable. There were two levels of Intelligence – High Group Intelligence (I1) and Low Group Intelligence (I2) and two levels of the variable Achievement Motivation (A) – High Achievement Motivation (A1) & Low Achievement Motivation (A2).

Sajedi and Shafizadeh (2015), investigating the relationship between learning strategies, achievement motivation and academic performance among Iranian students of Semnan University of Medical Sciences. The methodology of the descriptive-survey research was applied. In this research, Weinstein and Mayer’s Learning Strategies Questionnaire and Hermans Achievement Motivation Questionnaire were used. The questionnaire of Weinstein and Mayer’s learning strategies was used to analyze students’ studying methods. To do so, 400 students were chosen as the research sample by Cochran sample size formula using random sampling method, after distributing questionnaires and collecting them, 374 questionnaires were obtained. In order to analyze data, ANOVA test, Pearson correlation coefficient, stepwise Regression, and Fisher’s z test were used by SPSS software. Findings revealed (i) a positive and significant relationship between types of learning strategies and students’ academic performance was found; (ii) there is a significant relationship between achievement motivation and academic performance; (iii) using learning strategies, increases achievement motivation in students; (iv) significant difference does not exist between female and male students in using types of learning strategies and academic performance; (v) difference of correlations in both
female and male groups with cognitive and meta cognitive strategies is not significant; (vi) there is a significant difference among female and male students in terms of achievement motivation and academic performance; and (vii) there is a significant difference among students of different academic years in the variable of achievement motivation”.

Sirous, Hakim and Moridi (2016), examining the relationship of academic performance with achievement motivation and self-efficacy beliefs on a sample of 250 students selected through multistage cluster sampling method revealed that: “(i) achievement motivation as well as academic self-efficacy beliefs had a positive and significant relationship with academic performance; (ii) achievement motivation and academic self-efficacy beliefs played a major role in predicting academic performance”.

Rout and Pathak (2017), examining relationship among achievement motivation, academic performance (CGPA) and self-concept of undergraduate students of Amity University revealed a significant and positive relationship between academic performance and achievement motivation; academic performance and self-concept; achievement motivation and self-concept. A sample of 85 students was taken on the basis of random sampling method. The Achievement Motivation Scale and Robson’s Self-concept Questionnaire have been used to find out students’ motivation level and self-concept respectively. The Cumulative Grade Point Average (CGPA) of students is considered to be the indicator of academic performance.

2.5 OVERVIEW

After reviewing the related literature, it has been found that most studies stress the use of multimedia instruction. It helps in improving academic achievement of students. Multimedia has totally transformed the concept of use of computer in teaching-learning process. It has also been determined by various researchers that multimedia has unique characteristics of communicating different concepts and holding the attention of students, which in turn improves the academic achievements of students. Most of the investigators have found its power of presentation more effective due to the integration of various elements like text, audio, video, graphics and animation. On the other hand, if we specifically explore the utility of multimedia
instruction for students’ academic achievement, it has been found that many studies have been done in this area, but still there is a need of lots of work to be done in this direction with some other variables. The present study is an attempt to support previous studies and finding the new direction also. Perhaps, this study will be helpful in revealing the effect of multimedia instruction on academic achievement in relation to cognitive styles and achievement motivation and will also stimulate the teaching-learning process. Therefore, the investigator found it suitable to conduct a study on the effect of multimedia instruction on academic achievement in relation to cognitive styles and achievement motivation of 9th grade students in English.