CHAPTER - II
REVIEW OF LITERATURE
CHAPTER-II

REVIEW OF RELATED LITERATURE

Review of related literature plays an important role in the field of research. The object of review of research study is to locate and evaluate the past as well as the current studies of the research, concerned with planned investigation in hand.

In order to create a practical background for the plan and procedure of the study in hand, it is desirable to refer to the related studies on the subject of enquiry. The investigator has attempted to survey the literature available in the field of research and in related areas, with the aims of avoiding duplication and of making best use of the research done in the past. Therefore, in this chapter review of related research studies has been presented, with a view to get generalizations and frames the hypotheses for the execution of the present study.

2.1 RELATED STUDIES ON CONCEPT-MAPPING (CM)

Horton (1993) conducted meta-analysis study which used concept mapping as an instructional tool for improving student achievement and attitude and differences in effectiveness of teacher prepared concept maps v/s students prepared concept maps. The result indicated that concept mapping increased students achievements attitude on an average by 0.46 standard deviations.

Menon and Dutt (1993) found that concept mapping is an effective teaching strategy for IX class biology students.

Littrell (1999) evaluated the concept map learning strategy as an aid to learning of Economics and explored the changing knowledge schemata of learners. He suggested that concept mapping though not proven effective as an instructional aid, but is a useful tool for discovering student’s prior knowledge,
observing, developing, understandings, and identifying misconceptions. Concept map provides valuable information about learning process and students understanding on subject knowledge.

Lee (1999) studied the impact of Korean language on concept mapping tasks for English language learners. There was a significant difference for repeated measures study on students in favour of students taking English with Korean translator version.

Brown (2000) conducted the study about photosynthesis and cellular respiration through instruction level and concept mapping level. The results indicated that constructing concept maps in small groups can significantly increase the knowledge gained by lower level students but an opposite effect is seen on high level students who create concept maps in small groups.

Fells (2000) determined whether the treatment, concept mapping and ability level, had an effect on the achievement and retention of high school biology students. Data analysis does not show any significant difference between achievement of experimental class and control class.

Jenkins (2000) studied the concept mapping strategy for learning disabilities with respect to their use of a meta-cognitive strategy and the study analyzed the techniques beneficial for learning disabled.

Snead (2000) examined the effect of concept mapping on science achievement of middle grade science students. The results suggested that effect of concept mapping on science achievement is not clear and science educators should be cautious as to its practical use in the classroom.

Jo 11-Hyun (2001) investigated the effect of concept mapping as process versus concept map-as-product. The result showed significant difference between performances of concept mapping as process group and concept map-as-product group. The differences were both favorable to concept map-as-product group as predicted. However the concept map as product of group performed more poorly than the contrast group, which is opposite to the
prediction.

Materna (2001) studied the impact of concept-mapping upon meaningful learning and metacognition among foundation-level associate-degree nursing students. The purpose of the study was to compare the effect of a brain-based learning and study strategy, concept-mapping and a traditional learning and study strategy. The analysis of data revealed that concept mapping effectively promotes meaningful learning and metacognition, as evidenced through self-reported increases in designated LASSI (Weinstein et al; 1987). subscales.

Shortridge (2001) studied the concept mapping as an interactive learning tool in web based distance education, instructional design science, sociology, human factor engineering, visual communications and computer and information science. The study used a blend of qualitative methods that included document analysis, concept mapping and interviewing in order to probe an authentic context within a unique case orientation. The results indicated that concept mapping might be utilized successfully within web based distance education course more as a tool to increase interactivity and learning outcomes.

Chularut (2004) investigated the effectiveness of concept mapping used as a learning strategy with students in English as second language classrooms. A randomized pre-test and post-test control group design was employed. Seventy nine ESL students participated in the study. Variable of interest were students achievement when learning from English language text, students reported use of self-regulation strategies and students self-efficacy for learning from English language text. The findings showed a statistically significant interaction of time, method of instruction, and level to English proficiency for self-monitoring, self-efficacy, and achievement. For all four-outcome variables, the concept-mapping group showed significantly greater gains from pre-test than the individual study group. The findings have implications for both practice and research.
Richard (2004) examined the effectiveness of concept map to help students to understand natural selection and to reduce their misconceptions as measured by the conceptual inventory of natural selection (CINS). The study was conducted at high school with tenth grade students in biology classes. Results indicated that CINS is a valid and reliable measure of student’s conceptions and misconceptions about natural selection for this population. No correlation was found between students CINS and concept map scores. Concept maps scores were not a valid measure of conceptual understanding for this population of student.

Hay (2006) The purpose of his paper is to explain and develop a classification of cognitive structures (or typologies of thought), previously designated as spoke, chain and network thinking by kin chin “et al.” Design / methodology / approach. The paper shows how concept mapping can be used to reveal these conceptual typologies and endeavors to place the concept-mapping method in the broader context of learning theory and learning styles. Findings: The findings suggest that spoke structures are indicative of an epistemology, or of “learning- readiness”; chain structures are indicators of “goal-orientation” and networks are indicators of expertise. Furthermore, change that comprises simple elaboration of existing spokes or chains is likely to be the result of surface learning styles and the emergence of network indicative of deep learning. The utility of these different cognitive approaches is discussed. Research limitation/implications: The work is limited by the general lack of empirical testing, but the approach is presented as an important of hypotheses for future research.

Perrault (2006) conducted studies on concept mapping and its application to the re-socialization of students at the elementary level. The study employed concept mapping, a mixed-method design, to identify what re-socialization strategies schools should use to help elementary school students get along. Data was gathered from sample of 129 of non-special education students. Concept mapping methodology collects quantitative and qualitative
data providing structured conceptualization of the research question in the form of concept maps. Findings showed that concept mapping methodology and interpreted data across school members facilitates the strategic planning and evaluation process.

Coffey (2007) studied the use of meta-cognitive tools to facilitate knowledge production. This work describes a network-enabled meta-cognitive tool based upon extensions to concept maps that can be used to help course designers visualize and plan course organizations. This tool permits the user to create a novel type of course description based on the idea of an advance organizer. Course arrangements created by this method do not have the arbitrary linear sequences of topics typicality found in traditional courses at the college level. The tool is part of an environment that is designed to foster meaningful learning and reuse of course design and instructional content. This paper presents a description of this software tool, an approach to the creation of a course depiction from a Concept map, an example of a course that was developed iteratively using the tool, and a discussion of the ways that the tool fosters course and content reuse.

Kochhar (2007) studied the effectiveness of computer assisted instruction and concept mapping in acquisition of biological concepts in relation to styles of learning and thinking and concluded that students taught through computer assisted instruction (CAI) and concept mapping (CM) instructional strategy gained significantly more in acquisition of biological concepts than through SLM instructional strategy. Thus computer assisted instruction and concept mapping proved superior instructional strategies over SLM instructional strategy in acquisition of biological concepts. Secondly, Concept mapping (CM) and computer Assisted Instruction (CAI) did not differ significantly in acquisition of biological concepts but found significant interaction between instructional strategies and Style of learning and thinking.
Pickens, (2007) studied concept-mapping as methods to improve critical thinking. The intent of study was to examine the relationship between concept mapping and critical thinking in first year nursing students. A pre and post test was custom designed by HESI based on the participant’s current curriculum. The pretest mean scores were not significant between the two group (P = 0.825). ANCOVA revealed that there was no variable that had significant impact on pre test scores (P=.884). The result revealed that concept mapping group had a significantly great or improvement on their post test scores when compared to control group scores while controlling for a their covariates (P=.022).The qualitative analysis revealed that concept mapping provided the participants with direction on how to prepare for clinical assignments and model of thinking.

Skidmore (2008) conducted studies about concept mapping to promote meaningful learning at the community college level. The study explored the effectiveness of concept mapping and collaborative groups in promoting understanding of ecology at the community college level. The research problem was addressed to make them understand the relevance of human’s effect on the environment. Students from two sections of human ecology were assessed of their ecology understanding by a pre and post test design over a first and last semester and concept maps were collected and assessed. The study results showed no statistically significant difference between (a) post test scores of students individually constructing maps as compared to students who constructed in groups (b) map quantity from beginning to the end of the semester between the individual and group constructors. During the data analysis, all students collectively showed a significant improvement from pre to post test scores.

2.2 RELATED STUDIES ON CONCEPT ATTAINMENT MODEL (CAM)

Wager (1972) investigated the effect of different sequencing strategies on concept attainment. It was revealed that the three programmed instructional
treatments had similar effects on the post tests performance of the students in term of effectiveness.

**Krishan (1981)** carried out an experiment to study the concept attainment ability of professional and non professional courses of math’s students. A concept formation test was administered. Result of the study showed that professional and non professional do not differ on concept attainment scores.

**Lee (1983)** investigated the interactive effects of the personal traits of conceptual development and the different presentation forms of concept attainment. It was found that there was a statistically significant difference between instruction based on the definition and examples and based on the examples only.

**Kumara (1985)** studied the effectiveness of reception concept attainment model in term of pupil achievement and their relationship. The study concluded that group taught using reception concept attainment model gained significantly higher than those taught using conventional method of teaching.

**Kaur, (1986)** conducted a study on the effectiveness of training in concept attainment model of pre-service secondary school teachers and reported that training in concept attainment model did enhance the understanding of pre service teachers’ theoretical aspects of concept attainment model.

**Passi (1986)** investigated the effectiveness of strategy of training in models of teaching in terms of understanding reaction, willingness of teacher educators. The results regarding concept attainment model were that training in concept attainment model in the form of lecture, demonstration, discussion and peer practice feedback did enhance the understanding of teacher educator’s the theoretical aspects of concept attainment models. Further they found that the training in concept attainment model did bring significant change in teacher educator’s reaction toward concept attainment model. They also reported that
teacher educators were willing to implement models of teaching in teacher education programmers of the support system was available.

Schiever (1986) studied the effect of two teaching learning models on the higher cognitive processes in classes for the gifted students and concluded that process models offer a powerful method of teaching the higher cognitive processes to gifted students but that such model must be used correctly and frequently.

Dutt (1987) conducted an experimental study to see the effects of Bruner’s strategies of problem solving abilities of high school science students in relation to intelligence, cognitive styles and anxiety level and observed that the focusing strategy was superior one as compared to scanning strategy of problem solving.

Gangrene (1987) compared the effectiveness of a combination of concept attainment model and lecture method, with traditional method of teaching science to class VII and VIII students. The result revealed that combination of concept attainment model and lecture method was significantly superior to traditional method in teaching physics to class VII and VIII students.

Behal (1992) studied the effect of concept attainment model and computer model on acquisition of concept in mathematics and found that computer model of teaching was superior to concept attainment model.

Kochhar (1993) studied the effectiveness of Hilda Taba’s inductive thinking model and Bruner’s concept attainment models of teaching in learning of concepts in science and found that both strategies were equally good in learning of concepts in science.

Chopra (1994) investigated the effect of teaching through concept attainment model on acquisition of concept in English language and concluded that both the models namely concept attainment model and conventional model of teaching were found to be equally good in learning of concept in English.
language.

Gupta (1995) concluded that out of three information processing models of the teaching employed for teaching science concepts, concept attainment model and inductive thinking model were found to be superior to advance organizer model of teaching for teaching the concepts of science to class IX students.

Shylasree (1996) found that concept attainment model was very effective than traditional method in teaching biology to secondary school students.

Carbonaro (1997) studied the computational cognitive modeling of concept attainment used for qualitative and quantitative procedures. The researcher concluded that constrained networks learned a set of rules which produced greater discrimination among exemplars without any loss to correct categorization.

Brown (1998) examined the effect of human genetic concept attainment in secondary biology students through the use of specifically constructed bioethical case studies and a decision making model. The study consisted of 54 high school biology teachers and 2300 high school biology students. Selected teachers attended workshops on topic “Genethics”. There was found no significant difference between the control group & experimental group on the genetic concept attainment as measured by the Human Genetics and Bioethics Educational Laboratory (HGABEL).

Martindale (1998) studied effects of three teaching models namely direct Instruction, concept attainment and group discussion. The result indicated that there was no significant difference between test scores or number of test attempts needed to pass for participants from three groups. It was also found that more experienced users benefit from teaching model such as concept attainment or group discussion.
Driver (2001) examined the effect of two teaching models on community college students in an online college algebra lesson. Participants received either a direct Instruction or concept attainment lesson. A repeated measures analysis was used to determine the statistical significance in this experiment. The study indicated no statistically difference in the two treatment group meaning the direct instruction group performed similarly to the concept attainment group.

Hamilton (2002) investigated how the relationship of modifying a concept attainment model in a regular fifth grade classroom affected a child identified with asperger syndrome, a neurodevelopment disorder, in relationship to his peers. The subject used in this study was an eleven year old male who had been previously profiled as possible having Asperger Syndrome with a complete battery of psychological tests and a neurological evaluation. Qualitative methods inducing build notes, interviews, videotapes and audio tapes were used for data collection & his peers were instructed using concept attainment model. Scores were recorded. Follow up interview were conducted with parents & teachers to determine the impact of using concept attainment model. The result indicated that the child with asperger syndrome generated fifty percent fewer written language response than same- aged peers when modified concept attainment model was present in a regular classroom. Gain made on pre test, post test & retest could not be attributed to the presentation style of model given to student’s limited written language ability and difficulty attending to relevant stimuli.

Kumari (2002) compared the effectiveness of concept attainment model and inquiry-training model (ITM) with traditional method (TM). She concluded that CAM and ITM were equally effective and they are more effective than TM.

North (2006) examined the roles of learning styles and teaching methodologies within a data mining educational program designed for non-computer science undergraduate college students. Participants were randomly
assigned to receive the Association Rules lesion through either a Direct Instruction or a Concept Attainment teaching approach. The students completed Kolb’s Learning Styles Inventory, participated in the data mining lesson, and then completed a quiz on the concepts and techniques of Association Rules. A t-test was used to determine if significant differences existed between the scores generated under the two and an ANOVA was conducted to identify significant differences the four learning styles groups from Kolb’s instrument. The findings were there were no significant differences in quiz scores between the two teaching models or among the four learning style groups. Further investigation into the differences among learning styles within teaching models however did reveal that the Assimilator learning style students who received their instruction via Direct Instruction did score significantly higher on the quiz than did their learning style counterparts who receive the lesion via Concept.

**Hernandez (2006)** in his study factors influencing the under representation of Latinos in higher education and observed three primary categories which may contribute to the low educational attainment levels of students in the Latino community, including (1) family background, (2) parental support, and (3) overall educational experience.

**White (2007)** focused on the barriers to educational attainment and the successes of non U.S. born Latinos. Five themes emerged from the student’s discourse, and four themes from faculty and administrators. The findings highlighted the student’s language difficulties, the issue of student identification and follow-up and various instructional approaches in terms of student success, the impact of family, friends and the community, as well as student motivation. The concept of time was linked to language acquisition and to work, family and school.

**Ravenna, (2008)** examined gifted student’s preferences of models of teaching and the specific factors contributing to those preferences. The sample population included students in grades 2-5 from economically, linguistically
and culturally diverse backgrounds, in urban, suburban, and rural districts. Students in the experimental groups were taught with instructional models by teachers who had participated in the differentiated professional development plan. Gifted and potentially gifted students were included. No significant differences were found between gifted and non-gifted students’ preferences for a model of teaching by grade level. Students cited interest and challenge as the primary factors influencing their choices. Gifted students preferred the group investigation model in 3 of 4 content areas and the advance organizer to the concept attainment model in language arts. A principal component analysis of the factors influencing students’ preferences for steps of the teaching model is revealed marginal differences between the choices of gifted and non-gifted student.

2.3 RELATED STUDIES ON STYLE OF LEARNING AND THINKING

Bogen (1972) reported that a person’s two hemispheres are able to function in complementary manners, therefore, improvement in the right hemisphere function results in the integrated mode of learning.

Pask (1976) studied styles of learning of sixty-two polytechnic students in two series of experiment, one in laboratory and other in the educational institutions. Both series were of conversational system which allows mental activities to be described in terms of dialogue and behaviors and found that learning styles affected achievement.

Reynolds & Torrance (1979) indicated that it is possible to modify a person’s preferred style of learning and thinking over relatively brief period of time (6 to 10 weeks). Not only changes are possible, but it seems that general directions of changes can be controlled. As more is learned about the mechanism controlling the development and alteration of styles and learning and thinking, it may become possible to train individuals to modify their information processing procedures to best fit the demands of their lives.
Cody (1983) found significant (P< 0.01) difference in learning style of high and low I.Q. students and cerebral dominance.

McGuire (1983) made an exploratory investigation of relationship between cerebral dominance as measured by SOLAT and problem solving strategies used by selected high school chemistry students. A relationship between cerebral dominance, as measured by SOLAT and problem solving strategies used by subjects was determined to be statistically significant.

Riana (1984) studied that right brain can be cultivated by stimulating greater sensitivity through the technique of actively guiding the child to more differentiated perception. It may become possible to modify individuals information processing procedures which have implications in the field of problem-solving.

Lambkin (1985) studied about individual difference in learning style and found that, learning style does exist. Secondly, learning style is not difficult to identify and diagnose. Thirdly, when students are taught through their preferred learning style, academic achievement is enhanced.

Dunn (1987) demonstrated that individual learning style varies and academic achievement could be improved by providing flexible teaching styles and classrooms environments where students can match their learning styles.

Coggins (1988) preferred learning style is influential on student’s completion of the external degree programme in distance education.

Bruno (1989) investigated the relationship between and among hemispheric processing, learning style preferences, instructional strategies, academic achievement and attitudes of developmental mathematics students. A significant difference did emerge between student's diagnosed hemisphericity and their learning style preferences.

Gill (1989) found that right brain training strategy emerged as a superior strategy to the left brain training strategy so far as creative problem-solving skills in Mathematics were concerned.
Smith (1993) concluded that learning style was not significant factor in the integrated learning system though integrated learning system made a difference in reading.

Shay (1994) studied the relationship between learning style and achievement for high school students in vocational education programs. The result concluded that the learning style would affect achievement such difference would be found the effect on English & Mathematics as compared to vocational achievement.

Sandhag (1995) found no significant interaction between teaching strategies and style of learning and thinking on achievement of students of class VII in Punjabi.

Cunningham (2000) studied to evaluate the use of Reuben Feuerstein Instrumental Enrichment Curriculum for teaching skills to students with learning disabilities. The result showed that on using instrumental enrichment curriculum, there were statistically significant gains in scores.

Health (2000) study examined the critical thinking abilities, critical thinking disposition and learning style of nursing students. Result indicated that students were entering the programme with overall positive disposition toward critical thinking. There was not a significant growth in critical thinking abilities. Learning style preferences identified as most important by students when learning is new or difficult information.

Mitchel (2000) studied the effect of matching teaching style with learning style on achievement and attitudes for women and indicated that on achievement and attitude scores for women learning styles has higher impact then instruction.

Zhang (2004) investigated the role of thinking styles in University students’ preferences for teaching styles and their conceptions of effective teachers. The results indicated that students thinking styles made a difference in their conceptions of effective teachers.
Yunfeng (2006) research examines the roles of thinking styles in learning and achievement among Chinese university students. Three studies were conducted. Study first and second quantitatively examined the roles of thinking styles in academic achievement while ability and personality traits are statistically controlled. Study third qualitatively cross-validated the result from the studies first and second and explored if and how student made use of thinking styles in course of learning. Study first involved 223 first year students. Study second was conducted among 504 students of all four academic years and 10 teachers. 45 students participated in focus group discussion in study third. Data analyses of study first were conducted at the individual styles and study second were undertaken at the level of style type. Quantitative results indicated that he predicted significant relationship of student’s achievement with thinking styles; ability and personality traits were not supported.

2.4 RELATED STUDIES ON STUDY HABITS

Various research workers and educationists who rendered pioneer contribution in the field of study habits especially emphasize study skills. Factor like study habits play an important role for the scholastic attainment of a child. The following studies supported in favour of study habits.

Alexander Woodruff (1940) found no definite relationship between study habits and scholastic success.

Diner (1960) observed that over-achievers and under achievers differed significantly in respect to their study habits.

Morrow (1972) revealed the marked difference over achievers and under achievers in their study habits at high school level.

Jamuar (1973) investigated study habits in relation to their intelligence, academic achievement, personality and background. He found statistically significant correlation between study habits and achievement.

Walia (1975) revealed no significant difference between study habits of high and low achievers, similarly no difference between the study habits of
male and female students of XI grade was found.

Tulsi (1980) found that study habits are one of the correlates of achievement in mathematics.

Patel (1986) has reported that the better and greater the number of good study habits, the higher was the achievement.

Oriola (1988) reported that a positive and significant correlation between the study habits and academic achievement of both over and under achiever students of both arts and science subjects.

Patel (1996) has reported that better and greater the number of good study habits, the higher was the achievement.

Gelat (1999) investigated “the effect of the study habits on educational achievement of the students of secondary. Main findings were: there is significant positive effect of study habits on educational achievement of the students of secondary schools. There is no significant effect of sex on the educational achievement of the students of secondary schools.

Kohli (1999) reported that study habits acted as redundant factor. Student having good study habits or poor study habits performed equally well.

Carter (2000) study determined the relationship of study habits, attitude and motivation to academic achievement in a selected course of study at historically black university. Questionnaire was administered to 191 students enrolled in Principal of Accounting (POA) I and II to examine the relationship of the criterion variable (academic achievement), predictor variables (study habits, attitude and motivation), and moderator variables (socioeconomic status, gender). Analysis of data revealed that there is a statistically significant relationship between study habits and academic achievement as measures by final grade POA I & II. No statistically significant relationship was found between attitude, motivation and academic achievement.
Franklin (2000) compared studies habits of Asian and European males. Assuming comparable intelligence between the two cultures, an investigation of factors influencing scores seemed reasonable. The result recommended that school should include courses of study habits in their curriculum.

Almahboub (2001) studied investigated the attitudes toward computer use and gender differences of sixth grade students and examined the relationships between student’s attitudes toward computers, school, motivation, empathy, creative tendencies and study habits. The researcher found positive attitude toward computer use. Girls had significantly more positive attitudes toward computer. It was also found statistically significant correlation between attitudes toward computer, school, motivation, study habits, creative tendencies, empathy and achievement in the informatics field.

Matthews (2001) focused on evaluating the impact of an intervention for academically underachieving college students. The investigation was conducted in order to determine the effectiveness of an academic support program on student’s participation, academic performance, and improved study habits. The study shows that there is increase in participation and prompted academic improvement.

Verma (2001) found that there were no significant differences in the study habits of students in science and arts groups. Both of these groups were found to be superior to commerce group with reference to study habits.

Dinesh (2003) found significant difference in the study habits of art and science students but science students were not different from commerce students in their habits.

Evans (2004) the purpose of the study was to explore the study habits of college students and impact of use of a brain based study strategy. The main finding of the studies were:(1) Students need to study more and more productively (2) Professors need to teach study strategies, structuring their courses to include study strategies as an integral part of the course content (3)
Meta-cognitive study strategies and higher order thinking strategies should be taught and supported.

**Kaur (2005)** investigated the study habit of adolescents in relation to academic achievement. The main finding of the studies was:

1. No significant difference between study habit of rural and urban adolescents was found.
2. There was a significant difference between study habits of boys and girls with girls having better study habits then boys.
3. Arts students had significantly better study habits as compared to science student.
4. There was a significantly positive co-relation between study habits and Academic achievement of adolescents meaning there by that better study habits resulted in higher academic achievement.

**Rani (2005)** investigated study habits of competition of professional college entrance examination in relation to degree of self actualization. The sample comprised of 226 entrance test competitors of medical, engineering, B.Ed entrance tests, male and female competitors and competitors from rural and urban. The study revealed that, when study habits of all the male and female ‘competitors’ under study was compared, female aspirants showed significantly better study habits. Urban competition showed significantly better study performance as compared to competitors from rural area.

**Franklin (2006)** research focus on the study habits of under graduate education students. The purpose of the study was to describe the study habits of students enrolled in teacher education program at a large urban university. Strategies for effective studying have been developed to enhance the thinking processes that are required for active learning and for the transfer of information to various academic situations. The main conclusion of the current study was that by using various study techniques improves academic performance and significant number of students studies at home, cram the night...
before an examination, depend on other classmates to answer their questions and feel that they spend an adequate amount of time preparing for academic classes.

**Doll (2007)** studied the behavior of nursing students. The purpose of this research was to learn about nursing students’ study behavior, so that nursing educators can assist students with the development of study habits, attitudes and strategies. A sample of Bachelor of Science in nursing programs was used. Multiple regressions was used to analyze whether the independent variables (age, gender, race, high school grade point average, total study score, study and work time, college classification and enrolment status) predicted the dependent variables. ANOVA was also used. The findings of this research have several implications. First, students may need counseling on how to balance study and work. Secondly, nursing students need to be advised that both study time and study score are predictors of academic success.

**Sharma (2008)** studied achievement of IX class students of Chandigarh in Math’s in relation to intelligence and study Habit and concluded that:

1. Study habit affected the achievement of students in Math’s significantly.
2. Study habit has no significant relation with academic achievement at any level of significance.

### 2.5 CONCLUSION OF REVIEW OF LITERATURE

The research results indicated that concept mapping and concept attainment model enabled learners to focus on fine details, experiencing a structured, step-by-step approach, representing their knowledge structures graphically and visualizing programming concepts and procedures as a network of interrelated ideas. Findings indicated a need for concept mapping and concept attainment model to be used in conjunction with practical and cognitive apprenticeship. This will enlarge and strengthen the insight into the programming process and set a climate for enhancing programming skills of holistic learners. Most of the studies carried out under school conditions reveal
that teaching strategies seem to be especially effective for those students who typically have had problems learning under ordinary conditions. The research results also indicate that if a student can be provided with a history of successful and rewarding experiences in a given type of task, his confidence in his ability to perform similar related task will increase, his aspiration to learn will be heightened and his actual performance will improve. Thus consistent success of an individual in school learning over a number of years may lead to accompanying changes in his personality characteristics.

The studies conducted by Johnson (1997), Lee (1997), Williams, Douglas (1997), Chularut (2001), Hay (2006), Coffey (2007) concluded that concept mapping enhances learners learning represents mental models, helps in self-monitoring, knowledge acquisition strategies. Wang (2004) indicated that there was no significant difference found among the three teaching strategy groups. Jackson (2005) indicates that there were no significant differences between the three groups in their knowledge about how to teach science.


However, the studies conducted on Style of Learning and Thinking by Galin and Ornstein (1972), Mc-Cathy(1980), Rickman (1988), Bruno(1989), showed that cognitive functions, learning style preferences, instructional strategies could be attained more effectively using both the left and the right side of the brain. Cody (1983), Mc Guire (1983), Gill (1989) found significant difference in learning styles and cerebral dominance. Buzan (1976) found that schools have been educating “only half of the mind”. Webb (1983) concluded
that left-brain is the preferred brain in school learning but a large percentage of students failing in school prefer right-brain learning.

Study habit is a tendency of a pupil to study when the opportunity is given. Recent studies reveal that to maximize the academic achievement of the pupil, approaches to study and study habits of the pupils are also of great importance, besides the classroom environment. The establishment of proper study habits in the learners may be taken as one of the indicators of the efficiency of an educational system. The inability of a system to develop useful study habits in its learners leads to wastage and stagnation. The study conducted by Carter (1953), Tulsi (1980), Orioles (1988) found significant correlation between study habits and achievement. Kohli (1999) reported that study habits acted as redundant factor. Verma (2001), Dinesh (2003) found that there were no significant differences in the study habits of students in science and arts groups. Evans (2004) the purpose of the study was to explore the study habits of college students and impact of use of a brain based study strategy.

Today, qualitative improvement of education is of great woven for educational purpose. In our country, large numbers of studies importance and it can be achievement only by improving the quality of instruction. Even through great advancement in science as well as educational technology are made in our country, the methods of teaching prevalent are not significant to meet the requirement of the students at all levels. Several studies on classroom practices reveal that even through the student characteristics and societal expectations have changed, our educators still employ those traditional methods and modes of instruction. Hence, it is necessary to refine and improve the teaching methods and instructional techniques to realize the fullest potentialities of individual learner. At present it has been observed that classroom instruction has become too aversive too negative and improperly sequenced. Thus flexibility in instructional strategies is needed so that students can work at their own speed and participate actively in the learning process.
2.6 HYPOTHESES

Keeping in view the objectives of the study, the following hypotheses were formulated.

**Main Effects:**

1. There will be no significant difference in acquisition of science concepts among groups of students exposed to traditional teaching, concept mapping and concept attainment model.

2. There will be no significant difference in the acquisition of concepts of groups having differential study habits.

3. Style of learning and thinking will not account for differential achievement in acquisition of science concepts.

**First order interaction:**

4. There will not be any significant interactional effect between teaching strategies and study habits in terms of acquisition of science concepts.

5. There will be no significant interactional effect between teaching strategies and style of learning and thinking.

6. There will be no significant interaction between study habits and styles of Learning and thinking.

**Second order Interaction:**

7. There will be no significant interaction among teaching strategies, study habits and style of learning and thinking.