CHAPTER III

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INTRODUCTION

"Any worth while research study in any field of knowledge requires an adequate familiarity with the work which was already been done in the same area. A summary of the writings, and the previous research provides evidence that the researches is familiar with what is already known and what is still unknown and untested. Effective research is based upon past knowledge; this step helps to eliminate the duplication of what has been done, and provides useful hypothesis and helpful suggestions for significant investigation" (John Best. 1966).

For most investigators and scientists critical reading of the related literature serves as a stimulus to thinking and creativity. It is not a substitute for an independent work: it is one of the first step in the research process. It is a valuable guide to give an idea of what has been done in similar area, to scrutinise the methodology used to coordinate the study with others, to find gaps, to avoid duplication and to direct the work along useful lines and to arrive at an effective fruitful conclusions.

The study of related literature is useful for the investigator to find out what has already been done in the target area. Hence, a number of studies related to Computer Assisted Instruction conducted in India and abroad are reviewed and presented here in view of their relevance to the present study.

STUDIES RELATED TO COMPUTER ASSISTED INSTRUCTION (CAI)

STUDIES CONDUCTED ABROAD

Keywin (1980) conducted a study on 'Evaluation of Computer Assisted Metric Instruction in a 9th Grade Physical Science Program'. The results revealed that there was a significant difference in Metric Achievement in favour of CAI over the conventional method.
Burns Patricia Knight (1981) studied the pedagogical effectiveness of Computer Assisted Maths Instruction as compared to Traditional Maths instruction at the secondary and elementary school level, and found that the former was more effective.

Bradley Thomas Michael (1983) studied the effects of teaching American History in high school using computer. Analysis of covariance results showed that CAI enhanced student achievement significantly high for both male and female in French Grammar.

Taylor Vivian, Yvonne Baker (1983) studied the effects of achievement of vocabulary, comprehension and total reading of students using drill and practice mode of CAI. Analysis of covariance revealed that scores were greater for comprehension and total reading for the group receiving CAI as compared to the conventional method of teaching.

Porinchak (1984) made an attempt to find out the impact of CAI on the development of reading skill at the secondary level. It was found that there was a significant difference with regard to the learner preference towards the mode of instruction wherein the computer was preferred. The results also revealed that CAI and Lecture Method appeared to be equally effective for the average students.

William (1984) conducted a study on the effect of microcomputer usage on the critical thinking skills of middle school students. He reported that there was no significant difference between the groups of microcomputer and conventional method.

Chevrettee (1987) compared college students' performance with alternate simulation formats under cooperative or individualistic class structures. The results indicated that cooperative class room structure significantly increased cognitive gains. An interaction was also found between structures and the mode of simulation presentation with cooperative pairs. The subjects indicated a preference for the computer and pair conditions.
Huthaifi (1987) conducted a study to investigate the effect of instruction on the changing attitudes toward the use of computers. The results of the study indicated that computer literacy instruction can improve science students teacher's attitudes towards computers and the hands-on method of instruction is preferable to the lecture method for this purpose.

Sheriff (1987) conducted an exploratory study of the problem solving strategies used by selected young adolescents while playing a microcomputer text adventure. The results of the study indicated that young adolescents use a variety of problem solving strategies as they play a microcomputer text adventures.

Areuven Lazarowitz (1988) made an attempt to study the effectiveness of computer simulations on Biology. The results indicated that there is a supremacy of the CAI method and girls received higher scores than boys but the difference was not significant.

Legenstein (1988) conducted a study to find out the effects of varied instructional strategies in facilitating student recall from visually complemented text in computer based instruction. It was found that the presence of elaborated text increased recall performance at both low and high cognitive levels.

Rossow (1988) had undertaken a study on 'A fundamental - pedagogical evaluation of simulations for computer aided teaching'. In this study, an attempt was made to evaluate simulation software as one of the mode of computer aided education. Simulations from both the physical and human sciences were investigated. The study concluded that the computer could not replace the teachers but could only supplement and support him and it could be done individually or in groups.

Russell (1989) investigated the effect of CAI upon secondary school students' achievement and attitude in social studies. The purpose of this study was to provide information regarding various methods of computer utilization in social studies and the
effect of these methods upon student achievement and attitude. Results indicated that there was a good deal of support of CAI among social studies teachers, even among non-users.

**Sze (1989)**, examined the effects of different mastery levels which were used to terminate adaptive-computer-guided practice exercise on student achievement on a final examination and attitude towards learning. The results of the study revealed that all groups improved pre to post-test, but there was no statistically significant differences among groups on student post-test achievement, student attitude or student time, spent on the computer during practice. It was found that the number of time a student mastered the unit practices was significantly related to learning achievement.

**Berg (1989)** conducted a study on the influence of teaching skills and subject-matter-skills on student learning and satisfaction in the computer training environment. The study investigated the relationship of instructor's teaching and subject matter skills with student's learning and satisfaction in computer training. The results indicated a clear relationship between the student's satisfaction and instructor's teaching and subject matter skills. Class size had an impact on student satisfaction and large classes produced consistently lower ratings than small or moderate size classes. Student's satisfaction ratings used in the initial analysis were not found to be valid indicators of satisfaction.

**Dale (1989)** did quantitative review of the literature regarding CAI with Learning Disabled and Educable, Mentally Retarded and a total of 103 manuscripts were included in the content analysis. It is concluded that CAI is moderately effective with this population.

**Kacer (1989)** conducted a study on the impact of small group instruction upon attitude and achievement of students learning computer applications. This study revealed the efficacy of grouping students who are learning computer applications. The findings of the study showed that there was virtually no difference in achievement of attitude between groups and individuals.
Al-Rani (1990) examined the student's attitude towards learning about and using computers and to correlate their attitudes with their achievement in computer classes. Findings of the results revealed that students' attitude towards computers were positive, their achievement level was low. This substantiates that factors other than attitude influence student achievement.

Coorough (1990) examined the effects of three computer assisted instruction (CAI) instruction strategies: learner-control (LC), learner-control with adjustment (LCA) and program-control. The results of the study indicated that there was no significant achievement difference between subjects assigned to the PC, LC and LCA locus of instructional control strategies. There was a significant decrease in subject's state anxiety levels across measurement.

Driscoll (1990) conducted a study on 'A comparison of the relative effectiveness of micro-computer-assisted-instruction (MCAI) and conventional instruction for the teaching of references skills to seventh grade students'. The findings suggested that MCAI would be an effective method for teaching reference skills to seventh grade students.

El-Sanhurry (1990) carried out a study on 'effect of freedom' to control a Science learning sequence of computer-based instruction on achievement and attitudes of junior school formal and informal seasoners. The results of the study revealed that neither computer control nor learner control had specific differential effect on either the post or delayed achievement and attitude for a given reasoning ability group. The time did not impair the learner control group performance. Further analysis showed that there was no association between skipping or repeating lesson sections and reasoning ability in the learner control.
Hialt, Halen Marie Dillon (1990) studied computers and computer related technologies in the work place as presented in second grade students English Language, Arts, Science, Social studies and Maths text books. It concluded that students who do have computers available in their classrooms spend very little time on them, making the inclusion of computers and computer related technology, and it is time not very significant parts of their instruction.

Mayton, Garybrian (1990) investigated the effects of the animation of visual information when used in combination with text and static visuals in microcomputer-based instruction (MCBI). The results of this study were supportive of the contribution made by the animation of visuals in MCBI to the recall of information about dynamic process. The imperial evidence about the impact of animated visuals on a specific learning outcome contributes to effective instructional application and further study of an increasingly accessible visual form.

Whyte (1990) carried out a study to determine whether paired / cooperative computer assisted instruction (CAI) is an effective and as an individualistic approach. This study also examined the interactive effects of individual cognitive style on paired / cooperative CAI. The results indicated that no significant difference existed between the mean post test score of the participants who worked individually and those who worked in pair. The manner in which individuals are paired by individual cognitive style also made a significant difference in individual achievement test scores.

Barbara (1991) made an attempt to find out the relation between learning styles and computer-assisted instruction. The variables, one independent (instructional design) and one moderator (learning styles) were considered. The dependent variable was the learning outcome as measured by the scores on a post test. The results showed significant main effects for instructional design. It was also found that there was no main effects for learning styles and no effects for the interaction of instructional design and learning style.
Barron (1991) investigated the effectiveness of adding 'digital-audio-to computer' based training. The findings of the study were (i) There was no significance among the groups in achievement gain, (ii) There was a significant difference in the mean completion time across the three treatments, with the text only version requiring the least time on tasks, (iii) There was no significant relationship between student modality strengths and achievement levels, (iv) student's perception indicated a high degree of program acceptance across all lengths of treatment.

Bryan, (1991) carried out a study on comparison of compute competencies between teachers who use integrated learning systems and those who use stand-alone computers. The findings of the study revealed that neither participating group has any high degree of competency in computer technology. Also, teachers in the group that uses stand-alone computers tend to be more comfortable or knowledgeable to their eyes and have a greater sense of proficiency in terms of computer knowledge than those in the reporting district that uses an integrated learning system.

Feghalic (1991) conducted a study on computer based semantic network in educational research. The findings of the study indicated that the students who built semantic networks scored better in class achievement than students who did not. The use of computer-based semantic networks proved to be an excellent platform to reveal the way students construct knowledge and the way they articulate knowledge into such a knowledge structure.

Grogan (1991) studied computer attitude of selected students and educators in relation to computer access to experience and general. The findings of the study showed that students and educators have a positive attitude toward computers. Students had a slightly more positive attitude toward computers. Students had a slightly more positive attitude towards computers than educators. Younger students reflected a more positive attitude towards computers than older students. No relationship exist between age &
Students and educators displayed statistically significant relationship between computer attitude and home computer access. Those with more computer experience have more positive attitude than with little computer experience.

**Housman, B. Jane (1991)** conducted a study to access whether students who monitored their own learning, using the computer were able to construct the meaning for themselves thereby overseeing their own comprehension. The results of this study showed an increased understanding of the metacognitive processes involved in learning and an expanded use of the computer to help students improve their personal learning performance.

**Mory (1991)** conducted a study to compare the effects of an instructional treatment that presented adaptive feedback study time, and lesson efficiency within computer based instruction. The findings of the study indicated that there is no significant differences between the adaptive and non-adaptive treatment in the post test. New errors tend to occur about twice as often as would be expected from former studies.

**Orr (1991)** made an attempt to find out the implications of cooperative group instruction and learning style for the design of computer based instruction. It was found that there was no significant main effect for instructional delivery or learning style on performance. It was also found that there was no interaction between the two variables 'performance' and 'attitude'. The consideration of cooperative learning and learning style in combination does not appear to have a significant effect on either performance or attitude.

**Schultz, (1991)** attempted to determine the effectiveness of using examples and feedback when teaching a procedure using computer based instruction. The results indicated that feedback was not found to be significant on either the immediate or delayed post test. Examples were not found to be significant on the immediate post-test, but were significant on the delayed post test.
**Wilburn (1991)** investigated the relationship among individual preferred perceptual learning style and the treatment variable of CAI with and without computer-generated synthetic speech. The results indicated that the addition of computer-generated synthetic speech to CAI could significantly increase learning of certain learners and the addition of synthetic speech to CAI does not appear to be determined to the learning of any participants, regardless of preferred perceptual learning style.

**Barbacci (1992)** investigated the differences in 'learnt content' of tenth grade Biology students using CAI versus Computer Simulated Instruction (CSI). The focus of the subject matter was on Nucleic Acid and Protein Synthesis. The results showed neither method was superior to each other. The CAI group showed a significantly greater difference on the achievement test mean scores but both CAI and CSI groups showed no significant differences in their answers to the essay scripts. The attitude survey of both the CAI and CSI groups showed a positive attitude towards the use of computer.

**Gordon (1992)** carried out a study using teacher's perceptions about characteristics of student-computer interactivity to establish criteria for prevaluation of effective interaction in instructional software. Findings of this survey research revealed that the teachers may use the dimensions of interactivity as criteria for the prevaluation of instructional software in Mathematics of Reading / Language Arts, but should consider the difference of interactive requirements between grade level clusters before software selection is made.

**Ko, (1992)** studied the Interactive effects of timing of feedback and learners prior knowledge on the achievement and retention of a computer-based mathematical work. The purpose of this study was to extend the existing research on feedback on interactivity. The results of the study indicated that immediate feedback was superior to delayed feedback for immediate achievement but not delayed retention and also the value of delivery media that can provide immediate feedback such as computers and human teachers.
Tsai (1992) investigated the effectiveness of three selected hierarchies of positive reinforcement stimuli, coupled with different presentation schedules on computer-based learning of the arithmetics concepts of addition. The implications of the study suggested that software designers should emphasize the quality of instructional content rather than entertaining the student. Positive reinforcement need not be provided for every correct responses. Computer-based learning of this type may be effective in improving student achieving.

Reagan, James (1992) studied an Exploratory study of the differential effects of a computer-based simulation system on the attitude and achievement of high school student (consumer math). It is found that the personal finance unit computer simulation system was created in a usable form, that students think studying personal finance is important, that the PFU was valuable to them, and that the computer is useful in society and relevant to instruction.

Sulimani, Traik (1992) studied the comparative effectiveness between computer assisted video instruction versus traditional teaching methods in providing computer literacy for Arab-speaking engineering students. A test in a Saudi university. It is found that students using CAVA performed equally well on all tests and generally performed CAVA.

Wolf, Narion Charlotte Gressett (1992) studied the effectiveness of graphic and textual advance organizers for students with differing Cerebral Hemispheric Dominance (Graphic Advance Organizers, CAI). It is found that right and mixed cerebral hemispheric doncinant subjects benefited on immediate post tests, when given advance organizers. For the delayed post-tests, all dominance groups benefited from advance organizers; the most effective for this population were the ones presented in graphic format.
Gao, Yong Qiang (1993) studied the factors affecting use of computer assisted instruction by selected Chinese university educators. It is found that the significant differences between use of CAI and age and English level; age rank and computer experience were also correlated to the use of CAI; all 5 factors examined in this study were statistically significant to use of CAI.

Ouyang, Ronghua (1993) conducted a study on "A meta-analysis: Effectiveness of Computer Assisted Instruction at the level of Elementary Education (K-6)". It is found that the present study confirmed that CAI could support the instruction of some academic subjects more than others; the use of drill and practice, tutorial, simulation, word processing and the instruction of computer language could positively effect children's academic achievement; and children's novelty to CAI could impact the effectiveness of CAI at the beginning of the CAI treatment. The present study also indicated that children in the intermediate grades benefited more from CAI than those in the primary grades and that newly developed computer technology could have an effect on increasing children's academic achievement.

Roberts, Michael (1994) compared the effectiveness of the delivery of an Interactive Computer Assisted Instruction module to a traditional lecture/lab delivered module (CAI). It is found that learners in the experiment group (ICAI) that scored 37.3%(19/51) on the pretest had a significantly higher adjusted mean posttest score than those learners in the control group.

Park, Seungbae (1994) studied the implications of learning strategies for designing Computer-Assisted Instruction. The study revealed that (a) seven learning strategies out of thirteen learning strategies were used in atleast one CAI package, (b) CAI packages that have been favourably evaluated by professionals contained more of the identified learning strategies than other CAI packages in their software, but not in their printed material, and (c) educational software evaluators could be easily trained to identify learning strategies in CAI packages.
Lu, Casey Roy (1994) studied the effect of a Micro-Computer-Based Biology study center on achievement and attitudes in high school Biology students. It was found that high school students would memorize questions and answers to the questions in order to obtain a perfect score while using the software, but they would not truly understand the biological concepts. Then, the software was modified so that all questions changed internally each time a problem set was run by a student.

Din, Feng-San (1994) studied the students' task time difference during Computer-Assisted Instruction and at Seat-work. It is concluded that CAI with a practice and drill focus, applied as an integral part of a course instruction, can be used as a classroom management strategy for urban high school students, as well as an effective instruction mode. The findings also suggest some policy implications with CAI.

Dale, Holly Duckett (1995) studied the effect of physical configuration of an ILS on reading and mathematics achievement of fourth grade students (Integrated learning system, Computer-Assisted Instruction, Academic Achievement). It is found that there was a significant difference between the mathematics achievement of the students eligible for free and reduced-priced lunch and students ineligible for free and reduced-priced lunch.

Chen, Li-Ling (1996) studied the effects of Static Graphics, Animated Graphics, and Digital Video on students performance and attitude in Computer Assisted Instruction. It is found that students' achievement test scores and attitudes would be significantly higher after receiving a computer-assisted learning lesson with text and digital motion video. Further, the computer graphics did not make a significant difference in affecting subjects' academic performance, but they did make a significant difference on subjects' attitude.

Wanbugu, Edward G. (1996) studied the factors affecting the use of hypermedia in foreign language instruction. It is found that there is a significant relationship between the use of Hypermedia and the students target language and also a significant relationship
between prior experience in using computer assisted instruction and perceived usefulness of Hypermedia. Further, it is concluded that students perceptions regarding the use of Hypermedia for foreign learning was unique to the individual.

**Thede, Linda Quiggle (1996)** studied the comparison of a constructivist and objectivist frameworks for designing Computer Aided Instruction. Although the objectivist group scores were somewhat higher on the comprehension and application level questions, these differences were not significant, and neither group did very well with this level of question. There was no correlation between either group's use of tools and outcomes.

**Ou - Yang, Yin (1997)** made the development and validation of the Instrument for Evaluating Chinese Educational Software (IECES). It is found that there were no statistically significant differences with regard to the variables of gender, age, years of teaching experience, computer experience, and knowledge of educational software. This implied that these individual teacher characteristics were not the main factors affecting software evaluations when IECES was used.

**Dreyfus, Francine L. (1997)** studied the use of computer assisted instruction by Young Children with disabilities. It is found that there were significant differences among programs in relation to the number of assistive technology devices available with public school programs indicating the lowest number of device in comparison to hospital / development disabilities clinics programs with the highest number of devices.

**Chadwick, Dianne kay Hutton (1998)** studied a meta-analysis of computer - assisted instruction in secondary mathematics classrooms. It is found that the implementation of CAI and development of curriculum utilizing CAI should be encouraged in secondary mathematics education. However, caution is imperative in implementing CAI because the effectiveness of CAI is influenced by a multitude of variables.
Tsuei, Mengping (1998) studied the effects of logo, programming and multimedia software on fifth-grade students creativity in Taiwan (china). It is found that logo programming software did not successfully enhance students creativity may be due to any of several possible factors. The cultural background of Taiwanese students, the lack of motivation, the deficient training in problem solving strategies, the brief treatment period, and the lack of teacher resources in the computer laboratory.

Fabry, Dasla Long dee (1998) studied the impact of Interactive Educational Multimedia Software on cognition (Multimedia, Software, Elementary School Students). It is concluded that interactive educational multimedia materials have the potential to mindfully engage learners. The strengths of interactive educational software are the variety of cognitive opportunities available to students through colorful, action oriented graphics and photo, current, relevant stories that engage students in discussion and reflection and activities that require interaction.

Song, Sang Ho (1998) studied the effects of motivationally adaptive Computer Assisted Instruction developed through the ARCS model. It is found that adaptive provision of motivational strategies was useful and that motivation to learn can be a reliable variable on which instruction can be prescribed through adaptive use of ARCS model.

Lyon, Ellen Beth (1998) studied the effect of Homogeneous and Heterogeneous review pairs on student achievement and attitude when utilizing Computer - Assisted Instruction in middle level earth science classes. It is found that student achievement was not significantly influenced by placement in homogeneous or heterogeneous review pairs, regardless of academic Quartile assignment. Achievement retention of students in experimental and control groups within each Quartile showed no significant difference.
Allen, Maris and Anne, Lumpkin (1998) studied the effects of Computer-Based Multimedia Lecture Presentations on community college microbiology students' Achievement, Attitudes and Retention. It is found that incorporating multimedia lecture presentations into the microbiology classroom contributes to improved student satisfaction, as shown by significantly more positive attitudes toward learning presentations when compared with traditional lectures.

STUDIES CONDUCTED IN INDIA

Palaniappan (1990) studied the effectiveness of CAI on mathematics learning. The results of the study showed that the group exposed to CAI performed significantly better than the conventional lecture method.

Shanmugasundaram and Stella (1990) studied the effectiveness of CAI on learning English grammar. They found that the CAI group performed significantly better than the control group that was taught by the traditional method.

Nachimuthu (1991) developed and validated CAI software in Botany on the topic of 'leaves'. Findings of the study proved the supremacy of CAI with reference to the selected software.

Purushothaman and Stella (1991a) proved in their study that CAI group performed significantly better in mathematics learning and the time taken by the CAI group was nearly two-third of the traditional group to complete the instruction on the selected topic.

Purushothaman and Stella (1991b) studied the effectiveness of CAI programme on learning 'Set Theory' at eighth standard level. The study concluded that the CAI was more effective method than the conventional method. They proved that the experimental (CAI) group performed significantly better than the control group taught by the traditional method, irrespective of sex.
Suri (1991) studied the effect of anxiety reduction on computer self-efficacy and computer anxiety to investigate the effect of audio taped relaxation and cognitive restructuring anxiety reduction techniques on college freshman in compulsory introductory computer classes. The results of this study indicate no difference in computer self-efficacy on computer anxiety level between the treatment and non-treatment groups. Although not statistically significant, resulting means of female students suggested improvement in both computer self-efficacy and computer anxiety than the males.

Anuradha Joshi and Bhuban Mohaptha (1993) studied the effectiveness of CAI and its effectiveness in terms of achievement. The results revealed that CAI material was found to be effective in terms of achievement of students.

Kalaiselvi (1994) developed a CAI package on Periodic Table using branching methods for Ninth standard pupils, and found that CAI was effective in teaching the pupils of ninth standard and also as an effective medium of individualised instruction.

Mahajan (1994) attempted to study the effectiveness of Computer Assisted Instruction (CAI) for teaching singular and plural at Grade II. The objective of the study was to compare the mean achievement of the students taught singular and plural through CAI and the traditional method. The major findings reveal that CAI was more effective for teaching singular and plural as compared to traditional method.

Balasubramanian (1995) made an attempt to find out the cognitive attainment of pupils in computer education specially in computer literacy, range of computer applications and computer programming. It was found that pupils studying in the higher standard have more computer literacy and higher cognitive attainment in computer applications when compared to those studying in lower classes.
**Mahapatra (1995)** examined the effectiveness of a software package developed for teaching chemistry to class IX students of Madhya Pradesh state. The major findings are (i) Developed software packages were effective in terms of achievement of the students on criterion tests. 70% of students achieved more than 60% of marks. (ii) The developed software package was significantly superior to traditional method when students overall achievement scores were adjusted with respect to intelligence. (iii) The developed software package was significantly superior to traditional method in terms of higher mental abilities in science when their mean scores were adjusted with respect to intelligence (iv) The developed software package was not to be superior to the traditional method when assessed in terms of scientific aptitude scores of the students.

**Rangaraj (1995)** conducted an experimental study to find out the effectiveness of computer Assisted Instruction in teaching physics at the higher secondary stage. It was found that CAI serves as an effective agent in achieving the instructional objectives in teaching physics at higher secondary level. It was also found that CAI as a support system to teachers in the classroom instruction was more effective when compared to conventional lecture method and CAI as individualised instruction.

**Ruberg et al. (1996)** conducted a case study to find out the student participation, interaction and regulation in a computer-mediated communication environment. This study showed that CML-based activities offered an alternative pattern of interaction which differed from face to face pattern. It was also found that the CML discourse encourages experimentation, sharing of early ideas increased and more distributed participation and collaborative thinking. This study suggested that the successful use of CML activities requires a classroom social environment that encourages peer interaction.
Christmann et al. (1997a) made an attempt to compare the effects of Computer Assisted Instruction on the academic achievements of secondary students to the traditional approach. This study employed a meta-analytic technique. It was found that students receiving traditional instruction supplemented with CAI attained higher academic achievement than those receiving only traditional instruction.

Christmann et al. (1997b) made a comparative study on microcomputer based computer-assisted instruction in different subject areas. The meta-analyse compared the academic achievement of students across eight curricular areas. It was found that students receiving traditional instruction supplemented with CAI attained higher academic achievement than the traditional instructional group. Among the eight content areas, students receiving instruction in science showed higher mean effect size.

Anandan (1998) undertook a study to find out the effectiveness of the Computer Assisted Instruction in Indian Economics of Eleventh standard. The major findings are as follows. CAI has produced significant positive effect on achievement in Indian Economics when compared to traditional method. Significantly favourable achievement was made in the components of knowledge and comprehension but not in application aspect of Bloom's taxonomy. Significant difference in achievement was found in CAI even after controlling the intelligence and socio-economic status of the students.

Shinde (1998) developed a CAI package on voice, a concept from English grammar for Ninth Standard (Vernacular medium) and studied the effectiveness of the CAI package. The findings of the study indicated that CAI package was useful and interesting and 70% of students did not feel the need for learning the topic again in the class though they were given only one chance to interact with the packages. Almost all the students have shown positive opinion towards the use of computers in education.
STUDIES RELATED TO PERSONALITY
STUDIES CONDUCTED IN INDIA AND ABROAD

A brief review of the studies on personality are presented here:

Olszewski, William Eugence (1990) studied the adult developmental needs. It is found that Extroverted Sensing and iNtuitive types chose Authenticity significantly more frequently than did Sensing and iNtuitive Introverts, while Introverted Thinking and feeling types ranked Acceptance higher than did Thinking and Feeling Extroverts. Perceiving functions for Extroverted Sensing and iNtuitive groups are instrumental in identification of Authenticity as critical to intimacy; similarly, dominant Judging functions are, for Introverted Thinking and Feeling groups, crucial to their valuation of Acceptance in intimacy.

Gibb, Diana Susan (1991) studied the relationship between psychological type and career indecision. It is found that counselors may want to pay special attention to how the J/P dimension affects clients' decision making and devise strategies to help perceivers reach closure and increase their decision making confidence.

Rutherford, Andrea Joyce (1992) studied the relationship between personality and comprehension of expository text (Technical Reading). It is found that the high reading group was mainly composed of iNtuitives, and the low reading group was mainly composed of sensors. Therefore the iNtuitive types have a natural advantage in reading.

Manchini, Teresa Maddalena (1993) studied the relationship between Mathematics Anxiety and personality type. It is found that there was no significant relationship between mathematics and personality type.

Yomela, Richard Anthony (1994) correlated the personality type and teaching method preference of the students in a Baccalaureate construction program. It is found that the discovery method was favoured by extroverts and by thinking individuals and also the lecture method was favoured by sensing individuals than their iNtuitive classmates.
Gillespie, Bonnie (1994) determined the relationship between personality type to mathematics achievement in high school seniors. It is found that there is no significant effect of MBTI type on mathematics grade point average. Introverts in the sample had significantly higher mean math grade point average than Extroverts.

Andelt, Larry Lee (1994) identified the coping strategies used by Personality Temperament groups which facilitate success in high school students (academic achievement). It is concluded that the types of coping strategies that a Sensing - Perceiving student and iNtuitive - Thinking student decide to use has a large effect on their grade point average.

Rangaraj, (1995b) studied the effectiveness of computer assisted instruction in teaching Physics at Higher Secondary stage in relation to learners' personality variables. It is found that there is no significant difference between the means of the group of conventional lecture method and CAI as individualized instruction with regard to the scores of the pupils on the psychological variables.

Watson-Collins, Loucrecia (1996) studied the relationship between Teachers' personality type, learning style preferences, and theoretical orientation to reading. It is found that the teachers' learning style preferences were not consistent with research on learning style as a variable of personality type.

Nuby, Jacqueline Freeman (1996) attempted an analysis of the learning styles of Native-Americans and African-American Secondary Students in grade Nine through Twelve. It is found that there were significant differences in the learning style preferences of American-African and Native American Secondary Students as a group.

Soucy, Kathleen (1996) studied the learning styles and personality of traditional versus non-traditional students. It is found that student classification was not significantly related to learning style and personality type using Multiple Regression at the 0.05 level of significance.
Peeke, Patricia Lynn (1997) studied the relationship between Vocational identity, racial identity and personality typology of African-American High School Juniors and seniors in an Urban Community. It is found that a strong association is either an introverted or extroverted pattern of interacting may be contribute to higher scores on the My Vocational Situation Instrument.

Martin, Joseph (1997) conducted a study on the relationship of student retention to teacher / student personality types at Summit Christian college. It is found that the combinations of Sensing-Judging with iNtuitive-Feeling and iNtuitive-Thinking faculty, personality types correlate positively with sensing-Judging students in retention.

Barr, Jean Mari Beth (1997) made an attempt to study the relationship among learning orientation, personality type, and demographic factors in undergraduate nursing students. It is found that the Extroversion and iNtuitive types are independent variables.

Pope, Maricko Ruth (1997) studied the impact of personality perception on innovation approach preferences in terms of creative thinking and behaviour. It is found that the significant relationship at the 0.01 level of significance existed between personality perception and innovation approach preferences in terms of creative behaviour.

Burley Hicks, Rosie Lee (1998) conducted a study on the learning style of Indiana's Secondary Health occupations students (Information accessing, Allied Health, High School). It is found that there were significant differences between the Extroversion / Introversion and the Judging/Perception preferences of secondary health occupations education students and practitioners and also there were significant differences between the Judging/Perception and Sensing/iNtuition preferences of secondary health occupations students and secondary occupations education teachers.
Duncan, Scott (1998) investigated the personality and cognitive characteristics of Technology students in Science and Engineering. It is found that the personality variables significantly increased the predictive ability of equations passed on ability and also the cluster analyses of personality variables failed to return distinct clusters, reflecting homogeneity of technology personality, lending credence to Holland's (1985) theory for this setting.

CONCLUSION

From the review of literature, the investigator understands that a substantial body of empirical studies finds that computer mediation has significant advantages in achieving traditional goals of instructional delivery. Recent evaluation of CAI applications in particular report consistently positive and on the whole moderately high achievement gains at all educational levels. The computer studies done at abroad highlights the computer as the effective medium. However, in the Indian context much of the potentiality of needs to be tested against empirical data of actual research findings. Finally there is a strong presumption that technology improvements results in more effective applications.

Taking guidance from the earlier researchers, the investigator designed the study reported in this thesis, to throw more light in the area of computer-assisted instruction. In present study an attempt has been made to study the 'Relative Effectiveness Among Different Modes of Computer Based Instruction in Biology in Relation to Learner's Personality Traits.'