CHAPTER III

REVIEW OF RELATED LITERATURE
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CHAPTER III
REVIEW OF RELATED LITERATURE

INTRODUCTION

Jonathan Anderson (1997) suggests that a review of literature is useful in initially surveying a field of work from the general to the specific or to work from tertiary and secondary sources of information to primary sources.

The main reason for a full review of research conducted in the past is to know the outcome of those investigations in areas where similar concepts and methodologies had been used successfully. Further, an extensive or even exhaustive process of such review may offer vital links with the various trends and phases in the researches in one’s area of specification, familiarising with the characteristic precepts, concepts and interpretations, with the special terminology, with the rationale for understanding one’s proposed investigation. Each research has a formal and systematic structure which generates appropriate norms for evaluating its outcome. In this connection, a review of previous related research studies will help the research to formulate a satisfactory structure for the present study.

In this chapter, an attempt is made to present a review of studies related to CAI and Personality. After a thorough analysis of the related studies a discussion is made and the conclusion is arrived at the end of the chapter.

STUDIES ON CAI

A number of studies have been undertaken on CAI in almost all sectors of learning in the developed countries. Many studies have proved that computer with its attributes of motivational sound, animated graphics and dynamic display of visuals can be used for classroom instruction. CAI has also been proved to provide many elements of instruction necessary for aiding the disabled students. The aspects of repetition, motivation and immediate feedback have been found to increase retention more effectively with low ability than high ability learners.
Alvestad, Kathryn Anderson (1991) studied the relationship of motivational orientation to achievement in the computer assisted instruction lab. It is found that higher intrinsic motivational orientation was associated with higher math achievement. It is also found that three aspects of motivational orientation (preference for challenging work, learning motivated by curiosity and interest and internal criteria for success of failure) exerted significant and positive impact on math achievement in the computer lab.

Griffin, Vernon (1991) studied the effect of monitoring adults during computer assisted instruction in preparation for the General Education Development (GED) test. It is concluded that students experiencing the CAI program benefited more when an instructor was present during the learning activity. It was also concluded that the gender does have an effect on performance in this type of GED preparatory program.

Nalley, Robert Engene (1991) studied the sources of results variance across Computer-Mediated Instruction research in science education. It is concluded that computer-mediated instruction tends to have a positive effect, the positive effect can be associated with an aptitude-treatment–interaction, the modes of computer-mediator instruction, the aptitude levels of the students and whether or not the experimenter is involved in the instruction design and delivery process.

Park Jean Sim (1991) studied the effects of computer-assisted instruction in teaching, reading to adult basic education students. It is found that the self-paced individualized instruction was more effective over CAI for improving reading skills. Comparison of change in attitudes toward the computer revealed that no significant difference existed between the two groups. Age difference made no significant difference on the mean gain scores of reading achievement and attitude change when students bearded with either CAI or self-paced individualized instruction.

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

Purushothaman & Stella (1991b) in another study found out that CAI is more beneficial to average and low achievers than the high achievers.

Purushothaman & Stella (1991c) conducted a study to find out the effectiveness of Computer-Assisted Instruction programme on learning Set Theory at the eighth standard level. They found that the experimental (CAI) group has significantly performed better than the control group taught by the traditional method irrespective of sex. They concluded that CAI was a more effective method than the conventional method in teaching 'Set Theory'.
Rumfelt Janice Joy (1991) studied the relationship of learning style and type of instruction about AIDS with achievement and attitude of college nursing students, (immune deficiency). It is found that there is a significant difference between the scores achieved on a written immediate posttest of knowledge by students who participated in a CAI lesson on AIDS and those who participated in L/D class; however, this significant difference was not maintained on the delayed posttest. CAI students also used significant less time to complete the AIDS lesson. Students who participated in the CAI lesson had a greater increase in their mean posttest scores than those in the L/D class, but it was not significant.

Townsend, Connie Thompson (1991) studied the math achievement of adult and traditional associate degree nursing students taught VIA Computer-Assisted and Lecture-Instruction (Nursing Education). It is found that there were no significant differences in math achievement between the two methods of instruction. There were no significant independent relationships between math achievement and anxiety level and ACT.

Brownlee, Christina (1992) studied the differential effect between humor treatments in Computer-Assisted Instruction when predicting achievement and anxiety. It is found that certain learners make benefit from the use of humor in CAI. Therefore, instructional designers may want to consider humor as an instructional option.

Chen, I. Sltin (1992) studied the use of microcomputers in physics courses in normal universities and teacher’s colleges in Taiwan, R.O.C. (Teacher’s Colleges, China). It is found that a high percentage of normal school students, in Taiwan do not use microcomputers in their Physics courses. Students generally agreed that micro computers use should increase (60 percent indicated that current use was insufficient for learning and studying) and the quantity of micro-computers and the amount of computer training are inadequate for students’ needs.

Daris, Haydn .N (1992) Studied the learning of psychopathology as a function of interactivity and academic performance in a computer-based study (CAI). It is found that the CAI-H condition would produce a greater mean gain score.

Lucas Lerr ieonne (1992) studied the effect of interface types on learning satisfaction for computer-assisted instruction. It is found that there were significant differences between the words-only and the combination of pictures and words, forms when early adolescents performed tasks using CAI.

Lwo, Lwun-Syin (1992) studied the effects of individualized examples and personalized contexts in computer–based adoptive teaching of algebra word problem (CAI). It is found that the effects for individualized examples and personalized contexts for interactive CAI were not significant. The treatment individualized and individualized personalized groups answered significantly
more practice problem correctly than the abstract group. Difference between the individualized and the individualized / personalized groups was not significant.

Mason, Laynii Nerrick (1992) studied the effect of inter-active video simulated chemistry laboratories on learning outcomes and attitudes of students enrolled in a beginning college chemistry laboratory course. It is found that students will be able to achieve the knowledge of laboratory safety, procedures, and the experiment without decreasing in attitude. Field – independent learners did achieve better than field dependent learners did.

Mickens, MCathur (1992) studied the effects of supplementary computer-assisted instruction on basic algebra 1 and basic algebra 2 achievement levels of mathematics at-risk minority students (Low-achieving). It is found that students in the experimental group receiving supplementary computer-assisted instruction had greater academic achievement than students in the control group.

Reagan, James Q. JR (1992) – studied 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, A. (1992) studied the comparative effectiveness between computer assisted video instruction and traditional teaching methods in providing computer literacy for Arab-speaking engineering students. It is found that students using CAVA performed equally well on all the tests.

Tsai, Year (1992) studied the feedback, feed forward and controls: A cybernetic model for instruction (CAI Human Computer Interaction). It is found that in the tested CAI program feedback control increased learning result. The combined effect of feedback control and user - requested feed forward produced the highest posttest scores compared to the effects of all other combined controls.

Van Ormer, Douglas (1992) studied the effect of hyper media – based learners- controlled instruction on learning atomic structures at the junior high school level (CAI). It is found that a structured instructional approach is more appropriate for junior high school science students, particularly when the subject matter places a higher cognitive load on students.

Wilburn, Hubert Ralph (1992) studied the learning styles and computer – assisted instruction with synthetic speech. It is concluded that the addition of computer generator synthetic speech to CAI could significantly increase learning of certain learners. Further, the addition of synthetic speech to CAI does not appear to be detrimental to the learning of any participants regardless of preferred perceptual learning style.
Wolf, Nar'ion 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 dominant subjects benefited 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.

Alexander, Margo Pamela (1993) studied the effective use of computers and graphing calculators in college algebra. It is concluded that the experimental group had a better understanding of the algebra concepts and of modeling real-world problem solving application through the use of concrete visualization. Students’ attitudes toward mathematics remained basically the same for both groups. However, students in experimental groups reported that the computer assisted instruction module designed for the study, the TI-81 graphing calculator, and the DERIVE software were highly effective tools and enhanced their understanding of the concept of functions and mathematical modeling. Through the use of technology, computers and graphing calculators, students have enhanced their concept images with regard to functions and modeling.

Auradha Joshi and Bhuban Mohaptha (1993) studied the effectiveness of CAI in terms of pupil achievement. The results revealed that CAI material was effective in terms of the achievement of students.

Clayton, Idalong (1993) studied the relationship between computer assisted instruction in reading and mathematics achievement and selected student variables (Reading achievement). It is found that computer assisted instruction improved reading for students at the fourth grade level and increased positive attitude toward reading for third-and fourth-grade students in the low socio-economic category. The CAI students in grades 2, 4 and 5 made significant gains in mathematics achievement.

Fortney, Patrick Michael (1993) studied the learning style and music instruction via an interactive audio–CD-ROM. It is found that there are no significant differences in achievement scores or in thematic recognition scores for students with different learning styles.

Gao, Yong Qiang (1993) studied the factors affecting the use of computer assisted instruction among selected Chinese university educators. It is found that there are significant differences between the 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 related to the use of CAI.

Leali, Shirley Ann (1993) studied the cooperative and individualized learning with computer-assisted instruction in mathematics for at-risk high school students (Co-operative learning, at-risk). It is found that students in the
cooperative environment performed better on the mathematics post-test than those in the individualistic classes.

**Mc. Laughl & In, Timothy** (1993) studied the contributions to adult learning by combining expert systems and optical data storage technologies in computer assisted instruction. It is found that participants predicated that it would be possible to combine an expert system with an optical data storage technology (e.g.) CD-ROM, interactive video, CD-I in CAI within the next five years. Such an instructional system could benefit adult learners by (1) providing instruction that is individualized for each learner. (2) Creating performance support systems at the work site. (3) increasing the portability of computer assisted instruction systems to the degree that learning would not have to occur in the formal computer laboratory setting.

**Ouyang, Ronghua** (1993) studied the effectiveness of Computer-Assisted Instruction at the level of Elementary Education (K-6). It is found that the present study with those of the previous meta-analytic reviews, 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 have an impact on 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.

**AL-eisa, Ahmed Mulammed** (1994) studied the exploratory investigation of the effectiveness of learner control upon achievement of high ability and low ability students, by using CAI. It is found that high- ability students who were given learner control over content, over display of instruction over both, would gain higher mean scores than high- ability students who did not receive any control. However, high – ability students who received control over both content and display of instruction gained a significant higher mean score than low- ability students; but other groups gained no significant differences.

**Barker, Theodore Allen** (1994) studied the effectiveness of Computer-Assisted Instruction in Phonological awareness with below average leaders. It is concluded that both computer programs were successful in enhancing the phonological awareness skills of poor readers. In addition, the improvements in phonological awareness directly impacted the word identification skills of children who were struggling in their efforts learning to read.

**Din, Feng-San** (1994) studied on-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.
Ivers, Karen Sue (1994) studied the effects of computer-based co-operative, competitive, and individualistic learning condition on Adult Learners, Achievement and Near-Transfer performance (computer-assisted instruction). It is found that (1) students in the individualistic learning condition were more likely to report that they could work at their own pace than the students in the competitive learning condition, (2) students in the individualistic learning were less likely to perceive the instruction as boring when compared to the students in the co-operative and competitive learning conditions, and (3) students in the individualistic learning condition completed the instruction in less time than the students in the co-operative and competitive learning conditions.

Jones, Christopher Michael (1994) studied the LOCI of instructional control over feedback in computer assisted instruction. It is concluded that learners who receive elaboration feedback using computer-assisted instruction have a more positive attitude than learners who only receive verification feedback. Learning was not significantly increased or impeded when affording learners in the ability to control the feedback received during computer-assisted instruction.

Lu, Carey 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.

Mahajan (1994) made an attempt to find out the effectiveness of CAI for teaching singular and plural at II grade. The study made a comparison between traditional lecture method and the CAI. It was found that the CAI was effective for teaching singular and plural as compared to traditional method.

Nishino, Alan Koki (1994) studied an exploratory investigation to determine the effects of a Multimedia Computer-Based Science Learning Environment and Gender Differences, on achievement, and attitudes and interests of Students in an eighth-grade Science Classroom. The followings are found: (1) students in the experimental classroom had a significant high posttest mean score in ‘self-concept’ than the students in the traditional science classroom and (2) Female students in the experimental classroom had a significantly higher posttest mean score on ‘self perception as a student’ than both the males and females of the traditional science classroom and the males of the experimental classroom.

Park, Seungbae (1994) studied the Cognitive Psychology in Education: Some implications of learning strategies for designing Computer-Assisted Instruction. The followings are found that (a) seven learning strategies out of thirteen learning strategies were used in at least 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. (c) educational software evaluators could be easily trained to identify learning strategies in CAI packages.

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

Schmelz, Bernice A. (1994) studied the implementation of an integrated learning system in Tenth Grade Remedial English Courses and an examination of achievement, attendance behaviour and attitude (Computer Assisted Instructions). It is found that analysis of covariance of gain scores with the pretest as the covariant showed a significantly higher increase in reading comprehension scores for the control group than the treatment group, treatment group gains in English were larger than the control, but not significantly. The control group also had a significantly higher course completion rate. Absenteesim and discipline referrals were higher for the control, but only the discipline referrals.

Strohsahl, Gladys June Wood (1994) studied the effects of Computer-Assisted Instruction on the achievement tests scores of Seventh-Grade students. It is concluded that students who received instruction in language through CAI performed better on language achievement tests. No evidence was shown that achievement gain in reading, language, or mathematics for seventh grade students was connected to a difference in ability levels. Male students performed better than female students on language achievement tests. Non-white male students performed better than non-white female students, and better than both white female and white male students on language achievement tests.

Balasubramaniam (1995) made an attempt to find out the cognitive attainment of pupils in computer education specially in Computer literacy, range of Computer application 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.

Chhaya Goel and Basanta Mishra (1995) studied the future of computer education by 1997. The focus of the study was to explore the possible role of the teacher-training institutions to train B.Ed. trainees on computer education and its future status. The findings showed that the computer education program was running well at the B.Ed. level.

Cho, Yonjod (1995) studied the nature of learner’s cognitive processes in learner and program - controlled hypertext learning environments. It is found that there were no overall dramatic differences between the learner and program-controlled groups for cognitive processes during hypertext learning. However,
there were subtle group differences in meta cognitive processes and reading processes.

**Foley Ninerney, Mary E. (1995)** studied the comparison of Computer-Assisted Instruction with Teacher-Managed Instructional practice. It is founded that CAI produced increased performance in reading and mathematics when compared to TMI or the control situation. Age and sex had no effects on achievement and IQ moderately to highly correlated with achievement.

**Hamilton, William Alexander** (1995) made a meta-analysis of the comparative research on Computer-Assisted Instruction and its effects on elementary and secondary mathematics achievement. It is found that there were significant achievement differences between the elementary and secondary students crossing all ability levels and also there were no significant subgroup differences between the elementary and secondary level for low, average and high ability-level students were reported, or these that reported separately for male and female differences.

**Hassan, Rosli Hj.** (1995) studied the effect of an ESL writing workstation on ESL students' writing. It is found that: (a) time was not a significant factor in determining student's writing quality, (b) ESL students did not spend a lot of time on prewriting activities such as brainstorming and on-lining, (c) on-line ‘Guided’ prewriting activity has a positive relationship with the quality of student’s writing, (d) the WWS environment did encourage students to write multiple drafts for their writing, (e) recursiveness in student’s writing proved to be a significant factor in determining student’s writing quality, (f) revising earlier paragraphs only when the whole essay was ‘finished’ seemed to be a significant factor in determining essay quality, (g) students did pay attention to on-line teacher’s comments on their essays, (h) linguistic competence was not a predictive factor of student’s writing quality and (i) monitoring of what constitutes an essay had a negative relationship to the quality of student’s essay.

**Jones, Charles Martin** (1995) studied the component skills of workplace literacy and the utilization of Computer-Assisted Instruction to achieve it (Literacy). It is found that workplace literacy and general literacy are not synonymous and that companies were reluctant to engage basic skills / workplace literacy training programs.

**Mahapatra** (1995) Conducted a study to examine the effectiveness of a software packaged developed for teaching chemistry to ninth standard students. It was found that the package was effective in terms of achievement of the students in the criterion - referenced tests. The developed software packages was found superior to the traditional method in terms of higher mental abilities in science when their mean scores and overall achievement scores were adjusted with respect to intelligence.
Prindiville, Jean M. (1995) made a comparison of research-based and commercially available programs. It is found that the (Task Demonstration Model) TDM/CAI programs were more effective than the commercial CAI programs for teaching word recognition, coin recognition and coin-value matching on the following measures: percentage correct during acquisition and generalization, number of trials with maladaptive behavior, and number of trials requiring teacher prompts.

Purushothaman & Stella (1995) studied the criteria for selection of computer software. Their results revealed that mere presence of computers in schools do not guarantee that education will be improved. The teachers can make optimum utilization of the potentials of the computer by developing a critical attitude towards computer software.

Rangaraj (1995) studied the effectiveness of computer assisted instruction in Teaching Physics at Higher Secondary Stage. It is concluded that CAI as support system to teachers’ classroom instruction is more effective when compared to conventional lecture method and CAI as individualized instruction in achieving the instructional objectives in Physics at all levels at Std. XII.

Aguilar, Julia Vanloan (1996) studied how can multimedia is designed to assist comprehension of the literacy text for foreign language learners (Juan Rulfo Mexico). It is found that the multimedia program was successful in assisting students reading comprehension of the foreign language text.

Bjarnhson, Leona Darlene (1996) studied the strategies for improving the mathematics 30 (CAI) course. It is found that in both classes there was a high percentage (48.8%) of low scoring (below 40%) and high scoring (above 79%) students on two different diploma examinations.

Bowen, Victoria Smith (1996) studied the relationship of locus of control and cognitive style to Self-Instructional strategies, sequencing and outcomes in a learner controlled multimedia environment. It is concluded that (1) learners who are those adaptive in selecting a content sequence are less successful on learning outcomes especially when what adaptation takes the forms of skipped modules, (2) Achievement is likely to be higher for subjects who attributed success and failure to themselves (internals), (3) learners tending towards higher internality will perform better under a self imposed structure than learners tending towards higher externality, (4) learners tending towards higher internality are more likely to follow a suggested content sequence and (5) learners tending toward an analytical (field independent) cognitive style will perform better in a multimedia instructional course than learners tending toward a global (field – dependent) cognitive style.

Bradford, John David (1996) studied the impact of computer-related staff development on Teachers’ computer utilization practices. It is found that, as a consequence of the staff development, all of the participants increased their
computer use for administrative tasks and 80% increased their use of computer for instructional purposes.

Burchfield, Michael Leonard (1996) studied the effect of Computer-Assisted Instruction on the science process skills of community college students. It is found that there was no significant difference between the mean gain in integrated science process skills of those students who participated in the computer module and those students' who did not participate in the module as measured by the students' total TIPS score. The gain scores of students in the treatment group were significantly higher on TIPS sub-test S, Graphing and Interpreting Data, than these of students in the control group.

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 those 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.

Choi, Eunshik (1996) studied the development and implementation of interactive multimedia instrumental discrimination skills training courseware for beginning clarinet students. It is concluded that (1) Regular use of interactive multimedia could improve visual instrumental discrimination skills of beginning clarinet students, (2) There was no significant relationship between musical altitude and visual discrimination skills, (3) There was no statistically significant relationship between discrimination skills and instrumental performance, (4) Discrimination skills and self- assessment skills were somewhat related and (5) Interactive multimedia technology, could function as an agent for refreshing and motivating instrumental teachers and students and providing effective instructional aids for instrumental music classes.

Christmann, Edwin Patrick (1996) studied a meta-analysis of the effect of computer-assisted instruction on the academic achievement of students in grades 6 through 12 at urban, suburban, and rural educational settings. It is found that CAI appears to have its strongest effects among urban students; its effects are weaker among suburban students and weakest among rural students.

Culleeney, Maureen Ann (1996) studied the survey of student demographic and motivational characteristic of students preferring computer assisted instruction. It is found that demographic and academic - related variables were not related to overall evaluation of computer assisted instruction. Only 38% of subjects felt more positive about school in general as a result of using CAI. Higher external locus of control and agreement with the statement that CAI holds one's interest were predictors of feeling more positive about school in general as a result of using CAI. Motivational benefits of computer assisted instruction were enhanced understanding of course information and course materials, acquisition of
knowledge which can be used in other courses, having an individualized alternative to learning, and case of use of the technology.

Exyilmaz, Ali (1996) studied the effects of conceptual assignments, conceptual change discussions, and a CAI program emphasizing cognitive conflict on students’ achievement and misconceptions in physics. It is found that the CAI program, the conceptual assignments, and the treatments interactions effects were not an effective means of reducing the number of misconceptions student held and significantly improving students’ physics achievements in force and motion. Further, the content and the objectives of physics courses, and education of physics teachers are recommended to be changed to allow and provide the means for physics teachers to effectively deal with students’ difficulties in physics.

Fante, Cheryl H. (1996) studied the effects of Computer - Assisted Instruction on developmental English Instruction at a community college. It is found that the computer-assisted groups, INVEST and PLATO, integrated with traditional lecture/discussion, were the most effective instructional method for teaching development English.

Firsher - Stitt, Norma Sue (1996) studied the effect of an interactive multimedia computer tutorial on students’ undertaking of Ballet “Allegro” Terminology. It is found that the difference between the groups attained statistical significance on the overall written test score and the overall practical test score, the experimental group demonstrating better overall written understanding of ballet allegro terminology (at p=0.001) and better overall practical understanding of ballet allegro terminology (at p=0.040). For both groups, there was a high positive relationship between overall written and overall performed understanding (Pearson, at r = 0.79)

Hill, Memory Elaine Nelson (1996) studied the implementing ‘Norton Textra Connect’ in an urban secondary school. It is found that teachers had positive and negative reactions to manipulating computers and the research software. Teachers had to adjust to technical problems. Teachers experienced new opportunities in communicating with students.

Holden, Andrew Mark (1996) studied the effects of meta cognitive advice and control of sequence on student achievement and attitude toward Computer-Assisted Instruction and content. It is found that self-directed learning readiness is important with achievement in learner control of instruction and also that personal characteristics are an important factor in having control of CAI.

Ianno, Anthony, JR (1996) studied the effects of Computer – Assisted Instruction on reading achievement of learning disabled students. It is found that the comparison among individual reading skills shows that CAI was most effective in improving word analysis skills of LD students.
James, Mark Olov (1996) studied the improving second language reading comprehension by a computer-assisted vocabulary development approach. It is found that the useful academic vocabulary is as effective as skills based exercise in improving the academic reading comprehension.

Jones, Linda Jewel Sanders (1996) studied a comparison of the effects of Computer-Assisted Instruction using Logo and prescription learning on the achievement and attitude of second-grade students. It is found that the addition of a LOGO component can significantly increase basic skills and problem-solving application in mathematics. Females showed greater improvement than males in all treatments and also the minority students may learn more from LOGO than prescription learning.

Kee, Linda Anne Heldman (1996) studied the change in performance of high school students in mathematics and Reading tests subsequent to participation in integrated learning systems. It is found that:

1. For the mathematics achievement test, the mean gain score within the target sample was not statistically significant, whereas the corresponding mean gain score within the comparison group was statistically significant (p = 0.012).
2. For the reading achievement test, the mean gain score within the target sample was strongly statistically significant (p = 0.000/sp [+]), whereas the corresponding mean gain score within the comparison group was not statistically significant.
3. In the mathematics achievement test, the mean gain score of the target sample was not significantly different from that of the comparison group.
4. In the reading achievement test, the mean gain score of the target sample was significantly greater than that of the comparison group (p = 0.000/sp [+]).

Kettanurak, Vichuda (NUI) (1996) studied the degree of interactivity in an interactive multimedia instructional program (Information systems, learning style & performance). It is found that (1) students have more positive attitude if they use an interactive program rather a non-interactive one, (2) Interactivity does not necessarily influence students’ learning achievement, (3) Students’ prior knowledge of the subject influences the proportional gain score in learning achievement negatively and (4) Learning styles do not necessarily influence the students’ learning achievement or attitude.

Kim, Sara Junghwa (1996) attempted to incorporate supplementary Computer-Assisted Historical and Theoretical studies into applied music instruction. It is found that the participating students seemed to gain knowledge of the music they played, through the programs and were able to make connections between the given historical and theoretical instruction and the music. Students’ and teachers’ also showed positive responses to computer-assisted historical and theoretical instruction, although they expressed fear about their own lack of computer training and equipment.
May, Gwendolyn (1996) studied the use of Computer-Assisted Instruction in Non-conventional classroom environment in higher education. It is found that there was no significant difference between the achievement levels of the experimental and control groups.

Packard, Abbot Livermore (1996) studied the exploration of a Brunswik learning environment developed to instruct basic statistical concepts. It is found that the interaction between participants' cognitive attributes and CAI presentation types by an Aptitude - Treatment - Interaction (ATI). While a significant effect was not found in most of the recall tests, many disordinal interactions demonstrated tendencies that warranted further study. An ANCOVA was also performed using the total immediate recall scores showing significant differences among the CAI presentation types. The results of a one way ANOVA found that participants assigned to the text only CAI presentation method tested better than their counterparts using the graphic additions to the textual instruction.

Park Insen Hwang (1996) studied the cooperative learning and individual learning with computer assisted instruction in an introductory university level chemistry course. It is found that interactive, dynamic computer software, microworlds can be effective in the development of mental models that facilitates students' understanding of vector related Physics.

Rice, Custis (1996) studied the generation of academic Discourse by ESL learners through computer based peer tutoring. It is concluded that: (1) Peer Tutoring holds great promise for development of academic discourse in the L2, (2) But without training, tutors are likely to fall back on I-R-E teacher dominated discourse with a low proportion of reasoning, (3) Interactively using the computer facilitates a shift from traditional knowledge - transmission to cooperative knowledge - construction learning and (4) The students' use of elementary multimedia technology provides a window to a future shift from print to electronic technology and towards a knowledge construction paradigm.

Romiszowski, Hermelina Pastor (1996) studied an examination of students perceptions and practice. It is concluded that the study focus on the need for a holistic approach to the planning of technology transfer, where the issues of software portability should be addressed in conjunction with other cultural factors (both national and institutional) that are of equal importance for the effective adoption and use of an educational innovation.

Scott, Albert L. (1996) studied the effect of Computer-Assisted Instruction on proficiency test performance of High school students enrolled in Mandatory proficiency intervention courses. It is found that there was significant difference between posttest and pretest scores for math and citizenship. Further, it was concluded that pretest scores have predictive value for posttest scores and also pretest scores could be an effective tool for enhancing academic counseling for students and resource allocation decisions regarding ONPT proficiency intervention.
Stone, Theodore Thomas, III (1996) studied the academic impact of classroom usage upon middle-class primary grade level elementary school children. It is found that a significant difference was demonstrated in favour of the computer assisted instruction students. Further, the reading vocabulary, spelling and math problem solving achievement scores of this experimental group better adjusted mean scores in comparison to the traditional instruction students.

Thede, Linda Quiggle (1996) studied the comparison of a constructivist and objectivist frameworks for designing Computer-Aided Instruction. It is found that the objectivist group on the total questions and the recall level questions. Although the objectivist group scores were somewhat higher on the comprehension and application level questions, these differences were not significant. Neither group did very well with this level of question. There was no correlation between either groups’ use of tools and outcomes.

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.

Yu, Fu – Yun (1996) studied the effects of cooperation with inter group competition on student academic achievement affect and group process in a CAI Environment in Taiwan. The statistical analyses were found to support the affective and social benefits of cooperation without inter group competition on Taiwanese students in a CAI environment. Furthermore, the exchange of ideas and information both within and among the learning groups tended to be more effective and efficient when cooperation did not take place in the context of inter group competition.

Blue, Regina A. Bailey (1997) studied the effect of edutainment on recall. It is found that students who took the edutainment lesson had a significantly higher recall (P < 0.05) that students who took the Non – edutainment lesson. The reliability coefficient of the measuring instrument was 0.91.

Bradford, Johnella Elaine R. (1997) studied the effectiveness of instructional delivery systems on academic achievement in a selected collage course. It is found that the female students’ academic achievement was significantly higher than male students on all components of the final history examination regardless of age or instructional delivery systems. Older CAI female students did significantly better than traditional and multimedia students. Younger multimedia female students did not significantly better that traditional students.

Callaway Judith Ann (1997) studied an interactive multimedia computer packages on photosynthesis for high school students based on a matrix of
cognitive and learning styles. It is found that the experimental group performed significantly better than the control group on two separate tests on photosynthesis, one multiple choice the other short answer.

Chen, PI–CHI (1997) studied the effectiveness of computerized adult literacy education: A Meta-Analysis of literature from 1979 to 1994 (Literacy). It is found that the effectiveness of computerized adult literacy education was associated with the following variables: (1) Document type (publication sources), (2) Learners age, (3) Learners gender, (4) Learners reading level, (5) Type of organization Conducting literacy education, (6) Program type, (7) Subject matter, (8) computer application mode, (9) Type of software interactivity, (10) CBI delivery platform, (11) Experimental design, (12) Authorship of measuring instrument and (13) Instructional method for comparison.

Chibbaro, Julie Segars (1997) studied the cognitive effectiveness of Computer – Assisted Instruction and traditional classroom instruction for introductory level counsellor education students. It is found that there were no significant differences between the two methods of instruction.

Cortez, Nebor Felix, JR. (1997) studied a Computer – Assisted Instruction and its effects on both ESL (English as a Second Language) and NON – ESL. At-risk minority secondary students’ achievement. It is found that (1) CAI students did significantly better that TCI student on language in the medium Ability group, (2) NON – ESL students did significantly better than ESL students in the Easy Ability group on Spelling, (3) Black students did significantly better than Hispanic students in the Difficult Ability group on language, and finally a most interesting find that and (4) Females did significantly better than the males in math, language, reading and spelling academic areas.

Crawford, Hiram. JR. (1997) studied the efficiency of computer assisted instruction on adult student success in an urban community college data processing program. It is found that there was a significant positive correlation for CAI students, however, in the following areas: higher ultimate salaries after graduation, higher degrees earned, more computers owned, better preparation for their major field of study, better preparation for analytical ability, and better preparation for course content.

Dingle, Patricia Ann (1997) studied a model for implementing Computer-Assisted Instruction into the art classroom. It is found that the availability of a computer assisted instruction model to be used as a guide in art could significantly reduce the time needed by art teachers in designing their own computer-assisted instruction programs.

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.

Elder, Richard Walter (1997) studied an executive’s guide to implementing Instructional Technology in institutions of higher Education. It is found that interactive, self-directed learning and teaching can be fostered by technology and that technology can have the greatest benefit when the leadership creates an environment and climate conducive to such new experience.

French, Dorothy M. (1997) studied a computer-assisted instruction using interactive software versus traditional instruction in a college pre-calculus course. It is concluded that 1) the use of interactive computer software does increase the mathematics achievement of students, 2) the use of interactive computer software does not change the MAS-measured mathematics attitude of students and 3) the use of interactive computer software does change students’ attitude towards mathematics in a positive fashion.

Hayes, Burnice Legrait (1997) assessed the effectiveness of computer-assisted instruction in teaching communication skills to counsellor education students at a beginning graduate level. It is found that there is a significant difference between the pre-post videotapes not due to computer assisted instruction. It appears that students can complete a unit of instruction using CAI and attain a level of counselling skill development equal to that of traditional instruction.

Jackson, Sharon Louise (1997) studied the congruency of perceptions regarding student use of computer among Students, Teachers and Administrators. It is found that (a) there was no congruency among third- and fifth-grade students perceiving themselves as using the computer, (b) students in school perceived themselves as using the computer in Domain II (integration of computer with subject matter), (c) girls perceived themselves using computers and (d) teachers and Administrators perceived students using computers on a majority of the indicators (82%).

Johnston, Cynthia Wilson (1997) studied the comparison of the effectiveness of computer lab instruction to traditional classroom instruction in an adult reading program. It is found that there was no significant difference in posttest scores of adults in CAI lab versus traditional classroom for reading instruction. Also, there was no significant differences between posttest scores when examining the variables race, gender, age, income and education at the 0.01 level of significance selected for this study.

Kaser, Kareri Collura (1997) studied the effects of virtual reality on learning office layout design (Computer-Assisted Instruction). It is found that there was no significant difference based on instructional strategy between students’ scores on an ergonomic concepts test. When students’ attitudes toward using the computer as a part of the learning experience were measured, there was
no significant difference based on instructional strategy. Also, found, there was no significant difference based on the instructional strategy between students' expertise in designing an ergonomically correct office layout.

**Kim, Daeryong** (1997) studied an experimental investigation of the impact of link number and node size on the efficacy of Hypermedia training materials (Multimedia, Computers, Information Technology). It is found that multimedia material involving small size of nodes and many intra-links the must positive users’ perceptions and delivers the best learning performance.

**Lafrorna, Vincent Nicholas** (1997) studied the interaction of adult, learning styles and instructional design of Computer–Assisted Instruction. It is found that cognition style play a significant role in adult learners’ performance, at least in CAI learning environment. More importantly, intentional variations in the degree of structure imposed in a learning environment can differentially enhance learning performance.

**Lakharat, Patananya** (1997) studied the impact of Adjunct Questions Emphasizing the particulate nature of matter on students’ understanding of chemical concepts presented in multimedia lessons. It is found that there was a significant positive correlation of achievement on each part of the TCC with achievement on each other part.

**Machado, Patricia Bain** (1997) studied the effects of Computer – Assisted Technology on the Language Acquisition rates of second language acquisition students. It is found that there is a significant difference between the male and female experimental groups and the male and female control groups. However, the male and female experimental groups had higher gain scores than the male and female control groups.

**Mager, Guillermo E.** (1997) studied the status of midi in the curricula of higher education institutions offering degree programs in music (Musical instruments digital interface, sound recording, electronic music). It is found that ANOVA and chi-square analyses revealed significant differences (at the 0.05 level) between the responses of the music technology group and respondents from other areas.

**Midobuche, Rosa Maria** (1997) studied the effects of the writing to read Computer-Assisted Language Program on the English Language skills of Language Minority students. It is found that the majority of statistically significant mean score differences were found to be related to program participation. The Non – Limited English proficient students scored significantly higher than did the Limited English Proficient (LEP) students, regardless of program participation.

**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 found 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 main factors affecting software evaluations when IECES was used.

**Rinaldi, Iris Lillian** (1997) studied the effects of computer assisted instruction and teacher instruction on achievement in mathematics. It is found that there were no significant differences between the eighth grade students who received computer-assisted instruction, and the eighth grade students who received direct instruction from the teacher.

**Stanley, Rodney Bryan** (1997) studied the effectiveness of color and dynamic visuals as cueing techniques in Computer – Assisted Instruction. It is found that the format of the Computer – Assisted lessons effectively ‘cued’ one key concept for each screen. The adult subjects used for this study received no additional help from the cueing technique when learning recall or comprehension level information.

**Taylor, Violette J.** (1997) studied the effect of computer simulations and experiments on Sixth – Grade students’ learning in science. It is found that the students scored higher on a posttest than a pretest after participating in the experiment. Further, the students increased their understanding of scientific concepts due to hands-on instruction and Computer-Assisted instruction. The reactions of the teacher and the students toward the computer software being used were positive.

**Allen, D’Maris 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.

**Anandan** (1998) made an attempt to find out the effectiveness of CAI in teaching Economics at the XI standard level. It was found that CAI method has produced significantly positive effect on the achievement of the students compared to the traditional method. It was also observed that significant difference in achievement between CAI method and traditional method even after controlling intelligence and socio-economic status of the students.

**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.
Crawford, Oliver Gahlen (1998) studied the effects of a learning style seminar and a Computer-Assisted Instruction package on the academic achievement of selected seminary students. It is found that there was no interaction between the independent variables, the independent variables did not affect the dependent variable, there was a significant difference between the four groups, and the treatment groups scored significantly higher than the control group. Student's academic achievement was positively affected by participation in the learning style seminar, utilization of the CAI package, and combining the participation in the learning style seminar with the utilization of the CAI package.

Cunningham, Ann Crawford (1998) studied the Technology and Secondary English Educators. A study of perceived competence, use, access, desire for training and software value. It is found that teachers from both samples perceived their technology skills as average-teachers agreed that word processing and desktop publishing software applications were the most valuable types of software to their instruction. Although most secondary English teachers were exposed to technology by means of their own self study, these teachers indicated that their technology experience was most often guided by a colleague or friend.

Dickinson, Janet Fisher (1998) studied the influence of the early language connections program on primary student achievement in Fort Smith, Arkansas Public Schools. It is found that significant differences existed in (a) the reading achievement test scores of students who completed and students who did not complete the ELC program and (b) the reading achievement, test scores of advantaged students and disadvantaged students who completed the ELC program.

Edmonds, Gerald Samuel (1998) studied the instructional multimedia in a foreign language classroom: A systemic environment (Interactive Multimedia, Computer-Based Language Learning). It is found that the perceived benefits of CALL and IMM result not from the computers, but rather from the design and format of the overall course and also found that the issues raised by the study's participants are tied to larger issues of departmental organization and communication.

Finch, Curtis Ellsworth, JR. (1998) studied the effect of supplementary Computer-Assisted Instruction upon rural seventh-grade students to improve math scores as measured by the Michigan educational assessment program test. It is found that there was no significant difference on the posttest between those students who received the compressed CAI instruction and those who did not based on gender, time on the integrated learning system, and the before and after school format.

Jawad, Afif A. (1998) studied the impact of Computer-Based Interactive Instruction (CBII) in improving the Teaching – Learning Process in introductory college physics. It is found that the computer is a major component in the teaching of introductory physics, and therefore, may be a suitable substitute for the
traditional delivery system. Computers as an instructional delivery system are an alternative that may result in a higher level of student learning for many higher education courses.

**Miller, Lynn Louise** (1998) conducted the formative evaluation of Computer-Assisted Instruction on Computer Literacy. It is found that some of the participants expressed negative perceptions about the mechanics of navigating in the program. The negative perceptions seemed to have no relationship to previous computer experience or training, time on task, or topics viewed.

**Olech, Cord Gutek** (1998) studied the relationship between Teachers pedagogical beliefs and the levels of instructional computer use (Elementary School Teachers). It is found that teachers were electric in their pedagogical orientation. There was a negative correlation between behaviourist beliefs and level of computer use. Teachers who embraced an information processing pedagogy had a significantly higher level of computer use than their behaviorist counterparts. The level of computer use of the constructivist teachers was slightly less than that of the information processing teachers', but was not significantly different from either the behaviorist or information processing group. Once the personal variables of the teachers (i.e., innovativeness, computer relevance, computer self – competence and subjective norms) were used to predict level of computer use, the pedagogical orientation did not significantly to the prediction of the model.

**Speelman, Pamela K.** (1998) studied the effects of computer generated text slides with animation on short – term retention of knowledge (Instructional Design, Message Design). It is found that there was a significant difference in the achievement scores of posttest one between the treatment groups receiving line – at-a-time animation and these receiving no animation. Gender and age as covariates to the dependent variables of the two posttest showed to have no significant effect.

**Travis, Penny Cynthia** (1998) studied the effects of Computer-Assisted and Teacher-Led Phonological awareness instruction for first-grade students at risk for reading failure. It is found that the computer-assisted instruction in phonological awareness is as effective as teacher-led instruction for first-grade children with delayed development of phonological awareness.

**STUDIES RELATED TO PERSONALITY**

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

**Olszewski, William Eugence** (1990) studied a response to adult developmental needs. It is found that Extraverted 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 Extraverts. Perceiving functions for Extraverted
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.

Averett, Robert Lee (1991) studied the role of cognitive style in the use of information for organizational decision-making. It is found that the iNtuitive information gatherers were more likely to seek multiple sources, not to be constrained by organizational procedure, and be less confident of expert methods.

Gibb, Diana Susan (1991) studied the relationship between psychological type and career in decision. It is found that counsellors 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.

Stader, Sally Ann (1991) studied a loglinear analysis (Myers Briggs Type Indicator). It is found that the best-fitting model for the counseling groups contained the MBTI scales of Sensing-iNtuition (S-N) and Judging-Perceiving (J-P). The personal counseling group was iNtuition and Perceiving (N-P) and the academic group was Sensing and Judging (S-J).

Allyn, Donna Proske (1992) studied the instructor-studied personality congruence and student career Decisions. It is found that students receive MBTI interpretations are more likely to choose a congruent MBTI type career.

Reed, Calvin Wainwright (1992) investigated the problem finding and personality characteristics of academically talented and intellectually gifted secondary students. It is found that there were no significant differences between the groups with regard to personality type, cognitive style, nor preference for using iNtuition or Sensing as defined by the MBTI.

Rutherfoord, 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 intuitive, and the low reading group was mainly composed of sensors. Therefore the intuitive types have a natural advantage in reading.

Geiger, Rebecca Witherspoon Deal (1993) studied the variations with verbal or mathematical ability of highly academically talented adolescents and their personality characteristics. It is found that the verbal and equivalent groups had higher scores on Abstract intelligence, Sensitivity, Creativity, and individuality / withdrawal, while the math group showed higher Tough poise.

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.
Poillion, Many Jo (1993) studied the effects of teacher training on the alteration of teacher instructional style and the academic success of students identified with Attention – Deficit Hyperactivity Disorder (ADHD). It is found that there was a majority of students with ADHD evidenced a mismatch in significant in all four Jungian dimensions.

Yozzi, David Mitchell (1993) investigated the contextual relationship between intellectual development and psychological type. It is found that both Sensors and iNtuitive are equally represented in the higher positions of intellectual development.

Zweber, Ann B. (1993) investigated the relationship between type as identified by the Myers-Briggs Type Indicator and other factors of tenth graders at Coon Rapids High School. It is found out that there is a significant relationship between sensing and low achievement and less frequently between a factor and the other functions of type.

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 a iNtuitive-Thinking student decides to use a large effect on their grade point average.

Anderson, Judith Lynne (1994) studied the critical thinking to Myers-Briggs Personality type. Dominant function, and integrated process skills of Ninth-grade Physical Science students. It is found that there was a significant difference in the ability to use deductive reasoning: Sensates performed significantly better than thinkers and feelers, and iNtuitives performed significantly better than feelers.

Edwards, Judith Jones (1994) investigated the perceived accuracy of personality preference descriptors of Myers and of Kerisey. It is found that respondents would perceive the opposite type add-on statements as 'mostly untrue' or 'very untrue' was not supported. In the add-on opposite type descriptor statements in some type descriptions, pattern set may have been a factor in respondents’ answers.

Gillespie, Bonnie V. (1994) determined the relationship of personality type to mathematics achievement in high school seniors. It is found out that there is no significant affect of MBTI type on mathematics grade point average. Introverts in the sample had significantly higher mean math grade point average than Extravers.

Mowery, Ward Franklin (1994) investigated the relationship between selected personality variables and retention of students in the String Orchestra Program. It is found out that there is a significant difference between 6th and 8th grade subjects on the Judgement-Perception (J-P) personality variable.
Redford, Janice L. (1994) examined psychological type and Moral Development. It is indicated that (ISFJ) and (ISTJ) were over-represented in low and under-represented in high ‘P’ scores and also found the usefulness of typological frameworks in examining relations between personality differences and moral growth.

Vomela, 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.

Elsberry, Jeffery Brain (1995) compared the selected variables of instructional choice and achievement between group lecture method and facilitated self-paced method in college Health Science Physics. It is found that there were no significant relationships existed between choice of instructional method and the predictor variables. Four significant relationships were identified for achievement in health science Physics, the pretest, Math-Science GPA, cumulative GPA, and attendance. No significant relationships were identified between instructional method and either Mind Style Subgroups or Psychological Type.

Grandpre, Edward Arthur (1995) compared the real and ideal perceptions of a student living environment by Psychological types. It is found that there were no significant differences between Extraverts and Introverts, Sensors and iNtuitives, Thinkers and Feelers, or Judgers and Perceivers, on perceptions of actual residence hall environments.

Preston, Brain E. (1995) studied the relationship of individual and organizational characteristics to computer use among public school administrators. It is found that the central office administrators and secondary principals demonstrated higher use than did other categories of administrators. Age and gender did not correlate to individual or delegated use, but years of administrative experience correlated with delegated use.

Rangaraj (1995) studied the effectiveness of Computer-Assisted Instruction in teaching Physics at Higher Secondary stage. 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 regards to the scores of the pupils on the psychological variables like personality as measured by the posttest.

Haygood, Emory Langston (1996) made an analysis of learning conceptions based on three contextual modules compared with learning style factors based on the Myers-Briggs Type Indicator. It is found that ICDM (Interest Creating Discovery Module) of the learning conceptions inventory and the SN and JP scales of the MBTI contribute to a (synthetic) canonical variable together.
Nuby, Jacqueline Freeman (1996) studied a comparative analysis of the learning styles of Native-Americans and African-American Secondary Students in grade Nine through Twelve. It is fond that there were significant differences in the learning style preferences of African-American and Native American Secondary Students as a group.

Soucy, Kathleen A. (1996) made an attempt to study 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 Linear Regression at the 0.05 level of significant.

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

Auallone, Anthony J., JR. (1997) studied the cognitive styles of successful expatriates (Managers, Human Resource Management, International Assignment). It found that the inclusion of iNtuitive-Thinking (NT) is well.

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

Cox, Janet Karen (1997) studied the effects of contextual, learning-based instruction versus Computer-Assisted Instruction on basic skills in the selected vocational courses. It is found that math reading basic skills achievement scores were found to be significant. When a contextual approach was used versus a computer-assisted approach for teaching the basic skills. Since no statistical significance was found in students' personality/learning styles and basic skills math or reading gains, it was concluded that personality styles were not significantly affected by either instructional method. Overall, it was found that the attitude of instructors and students favored instruction in the basic skills to be contextually based instead of the computer-assisted approach.

Hannison, Teresa Delgadillo (1997) studied the personal learning style and teaching style of non-traditional teachers' carrier change and also developed Myers-Briggs Type Indicator (MBTI) descriptions for Air Force Commission Officers at Supervisory, Middle, Upper and Executive levels. It is found that there were significant differences between the MBTI's Sensing, Thinking and Judging (STJ) dimensions of the Air Force population and the general population.

Hoffman, Christine Ann (1997) studied the relationship to Board relations and district management. It is found that none of the Myers-Briggs dimensions is related to good relations with the Board of trustees and also that the personality dimension of 'Thinking' as opposed to 'Feeling' and 'Sensing' as
opposed to ‘iNtuition’ were positively correlated to the frequent use of good management practice.

Martin, C. Joseph (1997) studied 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.

Orifici, Kimberly Ann (1997) studied the relationship between psychological type and the learning style preferences of graduate psychology students under the implications for training with instruction. It is found that the several differences in learning style were observed between Extraverts and Introverts, Sensing and iNtuitive types, and Judging and Perceiving type of students.

Pope, Mariko Ruth (1997) made an attempt to 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 significant existed between personality perception and innovation approach preferences in terms of creative behavior.

Reynolds, Glenda Phillips (1997) studied the gender, learning style, locus of control, self-concept and achievement of gifted middle school students. It is found that, from ANOVA, students with the learning style ES (M=761.06, SD = 95.44) had significantly low SAT scores than students identified as EN (M=801.14, SD = 97.44), IN (M=818.00, SD=153.67) or IS (M=808.96, SD = 75.40).

Sharma, Chandrika (1997) studied the self-regulation based on personality type and learning styles of college students with Attention Deficit Hyperactivity Disorder. It is found that the individual differences in the personality type and learning strategies utilized by these students and the relationship between the personality type and learning strategies.

Webb, Evelyn E.J. (1997) studied the Myers-Briggs Type Indicator and Retention of students at the Mississippi School for Mathematics and Science. It is found that the students’ psychological types do not significantly influence their persistence to graduation.

Anaam, Mahyoub Ali (1998) studied the academic and non-academic characteristics of science and non-science majors in Yemeni High School (High School students). It is suggested that the learning styles are an important consideration for teacher educator. It is also important for them to communicate the impact of personal learning styles preferences to preservice and inservice teachers for their future work in the classroom.
Barto, Valerie A. (1998) studied the relationship between personality traits of selected New Jersey Public High School Educators and successful academic achievement of At-Risk students (Public education, Motivation, Eleventh-Grade). It is found that mathematics teachers with the predominant personality type Extraversion, Sensing, and Thinking were more successful with respect to student's growth (31%) on the HSPT than language arts teachers (18%) with the predominant personality type of Extraversion, iNtuition and Feeling.

Burley Hicks, Rosie Lee (1998) studied 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 Extraversion / 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.

Cabak, Marie Therese (1998) studied a descriptive examination of Attention Deficit Hyperactive Disorder in adults and Jungian Psychological Type (MBTI, ADID, personality types). It is concluded with a discussions of implications for the use of the MBTI in a psychotheapeuatic setting.

Derst, Kimberly Vess (1998) compared a residential and a commuter campus (Student leaders). It is found that no statistically significant results attributable to campus type.

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 district clusters, reflecting homogeneity of technology personality, lending credence to Holland's (1985) theory for this setting.

Gilbert, Angileen P. (1998) conducted a test – retest study of the Myers-Briggs Type Indicator (MBTI) and the Murphy –Meisgeier Type Indicator for Children (MMTIC) over a two years time period. It is found that the MMTIC may be more appropriate for use with middle school / junior high school and the MBTI for high school students.

Goeltx, Helen Rodden (1998) analyzed the relationship of personality type and technology training on a principal’s attitudes towards implementation of technology in schools. It is found that no significant correlation between the principal’s attitude and training in technology.

Hales, Karen Suzanne Ewing (1998) studied the relationship between personality type, life events, and completion of the doctorate degree. It is found that the two variables, viz. student perception of faculty support and accumulated
life stressors, users found to be significant as predictors of doctoral degree completion.

**Hayes, Laurel Ann** (1998) studied the descriptions and educational implications of experiences in an ecumenical and interfaith dialogue program viewed through the lens of the Myers-Briggs Type Indicator (MBTI) (Jewish, Christian, Seminarians Interacting). It is found that EFs, IFs, and Ts reacted differently to conflict. However, personality did not seem central to the content of the theological disputes that arose during the program.

**Michaud, Susan Marie** (1998) studied the use of iNtuition among expert social work practitioners (Decision-Making). It is concluded that iNtuition can be most usefully thought of as sensual awareness—perhaps of stored ‘emotional memories’.

**Nuckles, Charles Robert** (1998) studied the personality and Cognitive style characteristics of adult learners (Myers-Briggs Type Indicator, group embedded figures test). It is concluded that there is no prerequisite set of personality or cognitive style characteristics exists relative to self-directed learning.

**Rosica, Beth Ann** (1998) studied an alternative education on relationship of teacher retention to personality style at Vision Quest National Limited (Alternative education). It is concluded that the majority of teachers are represented by one personality style affects curriculum, instruction, staff development, student expectations, and student achievement.

**DISCUSSION**


Some of the studies revealed that CAI was very effective when it was supplemented with the regular Classroom instructions ( Van Ormer, Douglas, 1992; Mickens, Mearthur, 1992; Leali, Shirley Ann, 1993; Strohsahl, Gladys June Wood, 1994; Rangaraj, 1995; Fletcher, Janice Anundson, 1996; May, Gwendolyn, 1996; Chibbaro, Julicsegars, 1997; & Chadwick Dianne Kay Hutton 1998).


Hyper media-based instructions in CAI were more effective than that of others. (Van Ormer Douglas, 1992 & Wanbugu Edward. G., 1996).

Studies on CAI with a specific mode was effective when it was supplemented with the regular classroom instructions. (Reagon James Q, JR, 1992; Ouyang, Ronghua, 1993; Alexandar Mango Pamela, 1993; Rangaraj, 1995; Fisher-Stitt Norma Sue, 1996; Taylor, Violett. J., 1997). Further it was found that effectiveness of different modes viz. Drill & Practice, Tutorial, Simulation, Word Processing and instructional supports (Ouyang, Ronghua, 1993).

Studies on CAI with graphics & animation exposed that, CAI was more effective than that of others. (Narion, Charlotte Gressett, 1992; Chen Li Ling, 1996; Stanly. Bodney Brayan, 1997; Speelman Damela K., 1998).

Studies on CAI for disabilities vividly indicated that it has some impact on disabled learners than that of others. (Prindiville Jean, M., 1995 & Dreyfus, Francine, L., 1997). It is found that there was some positive impact on learners with mental disability (Prindiville Jean M, 1995).
Studies on cognitive style and CAI revealed that CAI was effective paired with the cognitive style of individuals upon the achievement (Park, Senughae, 1994; Cho, Yonjod, 1995; Bowen Victoria Smith, 1996; Callaway Judith Ann, 1997; Lafronza, Vincent Nicholas, 1997; Fabry Dala long Dee, 1998). Also, it was found that there was some effect on performance of the students in the computer-based environment due to their learning styles. (Rumfelt Janice Joy, 1991; Wilburn Hubers rulph, 1992; Callwayss Judish Ann, 1997; Lafronsa Vincent Nicholasd, 1997 & Crawford, Oliver Gahlen, 1998).

Computer-based co-operative instructions are found to be slightly more effective than that of others (Leali Shirley Ann, 1993; Iverr Karen Sue, 1994; Park Insen Hwang, 1996; Yu-Fu-Yun, 1996). Also, it is found that there was effectiveness in co-operative learning of Physics. (Park Insen Hwang, 1996).

Studies on meta-analyses of CAI revealed that CAI was effective than that of others (Hamilton Willian Alexander, 1995; Chen PI-CHI, 1997; Christmann Edwin Patrick, 1996; & Chadwick, Dianne Kay Hutton, 1998).

Studies on computer feedback revealed that it has impact upon reflected appraisals and the feedback provided by the computer was very much effective for the delayed posttest / retention test (Tsai Yean, 1992 & Jones Christopher Michael, 1994).

It was suggested that if the computer-based instruction is presented in elaborated text form it enhances the recall performances of the learners (Blue, Regina A. Bailey, 1997).

Studies were observed that computer literacy had the strongest effect in computer application (Connell, Earl Wayne, 1991; Balasubramanian, N., 1995 & Miller, Lynn Louise, 1998). Further it was observed that pupil studying in the higher standards has more computer literacy and higher cognitive attainment in computer applications (Balasubramanian, N, 1995). From the review it was found that most of the studies suggested that computer-based instructions are used as a effective tool to enhance the learners' achievement and performance.

Some studies on relationship between the factors like achievement, performance, etc. and the personality as measured by MBTI revealed that there was some relation or no relation between them. (Gibb, Diana Susan, 1991;

Studies on relationship between the learning style and personality as measured by MBTI showed that some effectiveness due to the influence of the personality, (Smith Doriskay Phelos, 1993; Nuby Jacqueline Freeman, 1996; HayGood Emory Longston, 1996; Watson Colling Lourccelia, 1996; Soucy Kathleen A, 1996; Harrison Teresa Delgadillo, 1997; Burley Hicks, Bosielee, 1997; Sharma, Candrika, 1997; Orific, Kimberly Ann, 1997; Reynolods, Glenda Phillips, 1997 & Anaam, Mahyoub Ali, 1998). Further, it was found that there was some influence of MBTI personality types viz. Thinking, iNtitution, etc. on learning style. (Orific, Kimberly Ann, 1997; Anaam, Mahyoub Ali, 1998).


CONCLUSION

Computers in education create a new environment in schools in helping to acquire a new skill to make an individual efficient in the science and education. Computer as an educational media is used to improve learners' skills in academic subjects at all levels of education. The interactive computer-based instruction
changes the learners’ thought and make them learn differently with computers, when compared to the traditional teacher based instruction. Studies in all fields indicate that learners learn as much with computer instruction as with so-called ‘traditional method’. Two learning advantages that have been demonstrated are time savings (Kulik, Kulik & Cohen, 1980; Reynolds & Pontious, 1986) and better transfer of knowledge from CAI to the practice area when compared to information learned in a lecture / discussion format (Huckabry, Anderson Holm & Lee, 1979). Additionally, two meta-analysis have demonstrated that CAI produce a small but significant increase in learning (Bangert-Drowns, Kulik & Kulik, 1984; Kulik et al.)

In the present study an attempt has been made to study the “relative effectiveness among selected modes of CAI in Physics in relation to learners’ personality.”