CHAPTER – 2

REVIEW OF RELATED LITERATURE

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CHAPTER-2
REVIEW OF RELATED LITERATURE

2.1.0 INTRODUCTION

First chapter deals with the conceptual frame work of the present research problem and primary matters regarding the research. It had the statement of the problem, terms defined, objectives of the study, hypothesis, importance of the study and the limitation of the study. But, for any specific research to occupy the place in the development of a discipline, the researcher must thoroughly familiar with both previous theory and research. To assure this familiarity a review of the research literature is done. It allows the researcher to know the amount of work done in the concerned area. The clarity of the problem is possible with the through understanding of the knowledge generation in the area of research. It provides the source for hypothesis. It avoids the replication. It suggests the method, procedure, sources of data and statistical technique appropriate to the solution of the problem. The review of the related literature provides some insight regarding strong points and limitation of the previous studies. It enables them to improve their own investigation and to arrive at the proper perspective of the study.

The review of related literature studied by the researcher is divided in to following categories.

- Study of the related literature in Science.
- Study of the related literature in general subject and educational technology.
- Study conducted in abroad in the area related to present study.

The studies have been analyzed by keeping objectives, methodology and findings of the study to drawn the conclusion to strengthen the rationale of the present research.
2.2.0 REVIEW OF RELATED LITERATURE CONDUCTED IN INDIA

Review of the related literature conducted in India broadly categorized in to two categories. Initially review of the literature in science are done then general subject with technology regarding computer and instruction are made.

2.2.1 REVIEW OF THE RELATED LITERATURE IN SCIENCE

Jeyamani P. (1991), *Effectiveness of the simulation model of teaching through Computer Assisted Instruction (CAI)*

Jeyamani conducted a research on effectiveness of simulation model of teaching through Computer Assisted Instruction from Avinashilingam Institute of Home Science and Higher Education for Women, Coimbatore as a part of M. Phil degree.

**Objectives**: (i) To find the effectiveness of the simulation model of teaching as compared to the traditional method (ii) To utilize the growing use of computer in education.

**Method**: Jeyamani developed a Computer Assisted Instruction (CAI) package in physics for class XI students. The sample for the investigation consisted students of standard XI of the two schools selected. The pre test post test method used. Mean standard, deviation and t-test were used to treat the data.

**Findings**: (i) The experimental group obtained a higher mean than the control group. (ii) The sex wise comparison provides to be insignificant. (iii) There was no significant difference in learning level between Tamil medium and English medium students.(iv) On the basis of the research findings it was concluded that the experimental group performed significantly better than the control group.

Joshi C.L. (1992), *The construction and try out of networks for some topics of physics for standard XII Science stream*

**Objectives**: (i) To increase the level of understanding of the pupil of higher secondary classes of standard XII science stream in the different topics of ‘Physics’ which are to be taught by using ‘network’ diagrams. (ii) To evaluate the effectiveness of the teaching using network diagrams compared to the teaching through the traditional method.
Method: pupils were divided into two groups. They are constituted with the high achievers and low achievers group. These pupils are taught the different possible topics with the network diagram. The sample constituted of pupils of XII science. pre-post test were administrated on the pupils.

Findings: (i) From the results obtained there is a significant difference on mean achievement post test scores of pupils belonging to group A and group B. (ii) There is no significant difference on mean of post test scores of pupils of high achievers of group A and high achievers of group B. (iii) No significant difference on mean post test scores of pupils belonging to the high achievers of group A and pupils belonging to low achievers of group B. (iv) Significant difference is obtained on mean post test scores of pupils belonging to the high achievers of group B and pupils belonging to the low achievers of group A.

Sindhi, N.O. (1996), *The construction and try out of multimedia package for the teaching of physics in standard XI*

Objectives: (i) To develop multimedia package in Physics. (ii) To study the effectiveness of multimedia package in terms of achievement of students. (iii) To study the effectiveness of teaching physics through multimedia package and conventional method of instruction. (iv) To check the retention of teaching through multimedia package.

Findings: (i) There is a significant difference between mean of pre test and post test scores of the experimental group. This shows the effectiveness of multimedia package. (ii) There is a significant difference between mean post test scores of controlled group and experimental group. This proves that the teaching through multimedia package is more effective in comparison to conventional method of instruction. (iii) There is no significant difference between the mean post test score and mean scores of retention test of experimental group. This shows that if the teaching is done through multimedia package than student can remember it for a longer time.

Phoolwala R.N. (1997), *An inquiry into the utility and effectiveness of microcomputers in teaching science for standard X*

Objectives: (i) To know the utility of microcomputer for self learning on the unit ‘Carbonic Compounds’ of Science subject of standard X. (ii) To check the effectiveness
of the used microcomputer for the selected unit. (iii) To study the effectiveness of teaching science through microcomputer and traditional method of teaching. (iv) To know the opinion of the students towards science teaching through microcomputer.

**Findings:** (i) The difference between the mean scores of pre test and post test of experimental group was significant. So it can be said that students can learn effectively through microcomputers. (ii) Students can learn science effectively through microcomputer than through traditional method. (iii) The students revealed highly favorable opinion towards science teaching through microcomputers.


Khirwadker conducted a research on development of computer software for learning Chemistry of standard XI from M.S. University of Baroda.

**Objectives:** (i) To develop CAI package in subject of chemistry for standard XI Science students, studying GSTB syllabus. (ii) To study the effectiveness of the software package in terms of instructional time and achievement of student. (iii) To study the effect of the software package on student achievement in relation to student (a) intelligent level (b) motivations level and (c) attitude towards the package. (iv) To study the attitude of the student and teacher regarding the effectiveness of the CAI package with regard to aspects of the software such as content of the software, presentation of the software, examples and illustrations, graphs and figures, evaluation items, Utility of the software and instruction given in the instructional manual that are provided with the software.

**Method:** The three chapters were selected based on difficulty level. In the actual experiment design was pre test, post test design. The data was quantitative as well as qualitative including teachers and students’ opinion about the package. The data analysis was done by ANOVA, ANCOVA and content analysis. The sample for experiment was 30 students in experimental group and 30 students in control group randomly taken. The time duration was one month for both the groups. Investigator had collected data of achievement through pre and post test data about attitude towards package through structured and unstructured interview schedule.

**Findings:** It was found that the software package developed for teaching three units of standard XI Chemistry textbook of GSTB was effective in terms of students'
achievement. Also CAI was found to be time effective. The experimental group took 45 hour time in average to complete the three units of Chemistry. Later on the academic achievement of student of experimental group was found to be affected by variables like IQ, academic motivation and attitudes and lastly, majority of experimental group students had positive attitude about various aspects of software package especially regarding presentation of content logical sequencing and language used for understanding the content. The school subject teacher always held the positive attitude.

Kadhiravan, S. (1999), *Effectiveness of Computer Assisted Instruction in relation to students use of Self-regulated Learning Strategies*

**Objectives:** (i) To find out whether there is any difference among the three instructional strategies viz. Lecture Method (LM), Computer Assisted Instruction (CAI) as individualized strategy and Computer Assisted Instruction with peer interaction (CAIPI) in terms of their effectiveness in improving the performance in physics among the higher secondary student with different level of cognition, viz. knowledge, application and understanding. (ii) To develop syllabus based computer software package for the selected units in physics at higher secondary level. (iii) To evaluate the developed computer software from technical and pedagogical points of view. (iv) To find out whether there is any difference among different instructional strategy and Computer Assisted Instruction with peer Interaction in terms of their effectiveness in enhancing the retention as revealed by the learners’ performance in the retention test. (v) To construct criterion referenced test (CRT) based on the content areas taught through different instructional strategies in the present study. (vi) To develop a tool to measure the students’ use of Self Regulated Learning (SRL) strategies. (vii) To find out whether there exists any relationship between the students’ performance in physics as measured by the post test and their use of self regulated learning strategies.

**Method:** The sample consisted of 105 students of standard XI (first year higher secondary course) studying in three different schools situated in Coimbatore and Harur in Tamilnadu. tools used in the study included syllabus based computer software packages, in areas such as wave motion elasticity, a pre-test developed in physics was used to access the knowledge of students at class X level, five adjective based criterion-referenced tests in selected content areas were developed; and Self Regulated learning
Scale (SRS) was developed to measure the students use of self regulated learning strategies. Statistical techniques like Quasi Experimental Design, S.D., ANOVE and t – value were used to analyze the data collected.

**Findings:** (i) Among the instructional strategies, viz. LM, CAI and CAIPI, CAIPI was the most effective instructional strategy in terms of realizing the instructional objectives in physics at higher secondary stage. (ii) Among the three instructional strategies, CAIPI is the most effective one in terms of its effectiveness in realizing the instructional objectives in the context of content with low difficulty level. (iii) There was a significant difference among different instructional strategies, viz. LM, CAI and CAIPI in enhancing the students’ use of SRL strategies. (iv) CAI and CAIPI had some influence on students’ use of SRL strategies while lecture method had not. (v) There was significant difference among the instructional strategies viz. LM, CAI and CAIPI in terms of their effectiveness in enhancing the retention of what was already learnt in physics. (vi) There was a differential effect on the cognitive development of the students in physics due to their use of self-regulated learning strategies. The study cites 193 reverences.  

Meera, S. (2000). *Relative Effectiveness among Different Modes of Computer-based Instruction in Relation to Students’ Personality Traits*

**Objectives:** (1) To find out whether there is any significant difference between the Conventional Lecture Method and the Computer Assisted Instruction (CAI) as an individualized Instructional strategy in terms of their effectiveness in realizing the instructional objectives in Biology at Class XI; (2) to find out significant difference among the different modes of Computer-based Instruction viz. Tutorial, Drill & Practice and Simulation in realizing the instructional objectiveness in Biology at Class XI; (3) to find out whether there is any significant difference among the different modes of Computer-based Instruction (CBI), viz. Tutorial, Drill and Practice and Simulation in terms of their effectiveness in enhancing the retention of cognition as revealed by the learners’ performance in the retention test; (4) to develop syllabus based CAI package; (5) to assess the personality of the subjects of the control and experimental groups using Cattell’s 16 P.F Inventory with a view to study whether it has any influence on the media effectiveness in realizing the instructional objectives.
Method: Quasi-experimental method as well as qualitative and quantitative approach was adopted for the study. The sample was taken four groups of each having 35 students selected through probability sampling method. Cluster sampling technique was adopted in the study. The tools were used in the study such as Cattell’s 16 P.F inventory for students, CRT developed by Raymond B and Achievement test.

Findings: (1) Different modes of Computer based Instruction, viz. Drill, Practice and Simulation were more effective than conventional lecture method in realizing the instructional objectives in Biology at Class XI. (2) Effectiveness of the conventional lecture method and the different modes of the Computer-based Instruction, viz. Tutorial, Drill and Practice and Simulation were not influenced by the learner’s personality. (3) There was significant difference among the different modes of CBI (Computer-based Instruction), viz. Tutorial, Drill and Practice and Simulation in terms of their effectiveness in enhancing the retention of cognition as revealed by the learner’s performance in the retention test. There was significant difference among the different modes of Computer-based Instruction in enhancing retention of what have already learnt. Seventy five references were included in the study.


Dalwadi conducted a research on development and try out of Computer Assisted Instruction in Science from the M.S. University of Baroda as a part of the M.Ed. degree. The research is of an experimental type. The researcher conducted this study on the unit of ‘Light’. As a tool the researcher prepared a Computer Assisted Instruction for collecting the data.

Objectives: (i) To develop CAI in Science for standard IX. (ii) To study the effectiveness of the CAI in terms of achievement of students. (iii) To study the opinions of the Science teacher and students regarding the effectiveness of the developed CAI.

Findings: (i) CAI was found to be effective individualized instructional technique for teaching science to standard IX students. It helped the student to learn the topic of ‘Light’ and clarified the concepts. (ii) Students were found to have a positive opinion towards the developed CAI. (iii) Students opinion towards the CAI was found to be favorable as far as the statement related to the interest, mode of presentation, content
clarity and the question asked in the CAI. (iv) A Science teacher was found to have a positive opinion towards developed CAI. Also, the data analyzed revealed that teacher has given favorable statements regarding content, language clarity, mode of presentation, clarity in graphics and evaluation procedure in developed CAI.

Patel, R. (2001), A study of learning through Computer Assisted Learning Material in relation to selected production variables and contiguity

Rupesh conducted a research on a study of learning through Computer Assisted Learning Material in relation to selected production variable and contiguity from M.S. University of Baroda, as apart of the M.Ed. degree.

Objectives: (i) To analyze CALM in relation to production variables and contiguity. (ii) To study the effectiveness of CALM in terms of mean achievement of students. (ii) To study the learning through various message items in relation to production variable and contiguity.

Method: The research is an experimental type. In order to study the effectiveness of the developed CALM pre test post test single group design was used. A single group of thirty students was selected purposely as a sample for the present study.

Findings: There has been found significant gain through interaction with the Computer Assisted Learning Material on Solar system and Magnet –Standard VIII through the computed correlated t values. The status of the CALM in terms of production variable and contiguity vis-à-vis achievement has been found quite higher, except on a few teaching points where there was need to improve upon graphics, mode of presentation, spatial contiguity of text and animation and temporal contiguity of animation and narration.


Objectives:(i) To assess the knowledge in computer, attitude to computer Assisted Instruction and teacher competency of Science teacher and (ii) To assess the effect of training on these variables.

Method: The sample consisted of 50 high school science teachers of the Thiruvananthpuram revenue district, Kerala randomly selected with the help of purposive sampling. Of these, only 35 teachers formed the experimental group. While the control
group consisted of 26 primary school teachers who were undergoing B.Ed. Course selected randomly with the help of purposive sampling. Tool constructed by Helen Joy, Samasanandaraj and Manickam, 1996 on knowledge and attitude. Computer Assisted Instruction Questionnaire was used.

**Findings:** (i) There was no significant difference on the teacher competency in the pre and post scores or between the experimental and control group. But teacher competency was positively related to post knowledge in CAI of the experimental group. (ii) There was a significant difference between the groups in their attitude towards computer education. As a result of training in Computer Assisted Instruction (CAI), the attitude of the experimental group became more favorable towards computer education. (iii) There was correlation between age and attitude towards use of computer. (iv) There was significant difference in the pre and post scores of the experimental group on knowledge in CAI and attitude towards use of computer.

Vasanthi, A. and Hema, S. (2003), *Effectiveness of teaching Chemistry for 1 year B.E. students through Computer Assisted Instruction*

**Objectives:** (i) To study the effectiveness of teaching chemistry through Computer Assisted Instruction over the traditional teaching Method. (ii) To study the effectiveness of the Computer Assisted Instruction over the traditional teaching Method in pre test scores and post test scores.

**Method:** The sample consisted of 60 students selected from 220 students of Sivnath Aditnagar College of Engineering, Tiruchendur, in Thoothukundi District on the basis of marks. Those students were divided into two equal groups of 30 each on the basis of marks obtained in the class test. One group was taken as the control group and the other group was taken as the experimental group. A pre test and post test parallel group experimental design was used. The experimental group was given the CAI software. Statistical technique like Mean, S.D and t-test computed to analyze the data collected.

**Findings:** (i) There is significant difference between the mean gain score of the control group taught through TTM and the experimental group administrated by the CAI in all units put together. (ii) There is no significant difference between the mean scores of pre test of control group taught through TTM and experimental group administrated by
CAI in all units together (Electrochemical and bonding). (iii) There is no significant difference between the mean scores of post test of control group taught through TTM and experimental group administrated by CAI in all units put together. The study cites 15 references.

Singh, B. (2005), Effectiveness of Computer Assisted Instruction for teaching Biology

Objectives: The study compared the effectiveness of Computer Assisted Instruction (CAI) as compared to lecture method on the topics ‘Tissues and cell’

Method: Experimental method was used for conducting this study. Pre test, post test, experimental group and control group design was used for the study. The sample selected 28 students (14 in control group and 14 in experimental group) of class IX by random sampling from the student studying in Ramanujan Public School. An achievement test was constructed to measure students’ learning about cell and tissues. It consisted of 60 items designed to measure knowledge, understanding and application. Students were taught cell and tissues by lecture method. Through CAI, CD-Rom for science standard class IX was used for teaching. Mean, S.D. and t-ratio were calculated to analyze the data.

Findings: (i) Both the methods were effective in enhancing the learning about cell and tissues. (ii) While lecture method was more effective than CAI for the teaching cell, CAI was more effective then lecture method for teaching tissues.


Objectives: (i) To find out the effectiveness of teaching Physics for Class IX through conventional method; (ii) To find out the effectiveness of reaching Physics for Class IX through Computer Assisted Instruction. (iii) To find out the effectiveness of teaching Physics for Class IX through Computer Assisted Instruction package of “Universe”.

Method: The present experimental study involved a parallel or equated group experimentation which was more complete and accurate than the one group experimentation. The sample of 32 students was divided into two equated groups of 16 students each. They are studying in IX Class of Sri Aurobindo High School, Shimoga.
The control group of another 16 students was taught the same content by conventional method. Mean, standard deviation and t test were computed the data for finding results.

**Findings:** (i) There were no significant difference between mean gain scores of experimental and control group of pre post. (ii) There was no significant difference between mean gain scores of pre test and post test of control group. (iii) There was significant difference between mean gain scores of pre test and post test of experimental group. (iv) There was significant difference between mean gain scores of post test of control and experimental group. The study cited 7 references.


**Objectives:** (i) To develop Computer Assisted Instruction package on two units of physics for XI Science student studying GSTB syllabus. (ii) To study the effectiveness of the CAI package in terms of achievement of students of experimental group. (iii) To study the relative effectiveness of teaching Physics in terms of two methods of teaching Physics i.e. conventional method of instruction and CAI package for students of traditional group and experimental group. (iv) To study the relative effectiveness of CAI with reference to the sex of the students of the experimental group. (v) To know the opinions of the students of the experimental group regarding the effectiveness of used CAI in Physics. (vi) To know the opinions of the teachers of the experimental group regarding the effectiveness of used CAI in physics.

**Method:** Multistage sampling technique was used by the researcher in the study. The pre-test post-test control group design was employed. Two schools, one in rural and another in urban area was selected to conduct the experiment. The sample for the experiment consisted 30 students each in traditional and experimental groups. Time duration was 28 days for both groups with two chapters of class XI Physics text book for the experiment of the study. The tool used was an opinionnaire for students of both groups. Opinions of the expert and subject teacher were invited by an evaluation sheet. For the analysis and interpretation of the data the statistical technique such as mean, S.D., t -test and chi square test was employed.

**Findings:** (i) The study has resulted in the development of a CAI program on ‘motion in one dimension and two dimensions’ and ‘Laws of Motion’ for teaching
Physics to the students of Class XI. (ii) The package was found significantly effective for
the students of class XI of both the groups. (iii) Comparative effectiveness of the CAI
method and the traditional method was measured by the experiment and CAI method was
found more effective in terms of achievement scores. (iv) In relative effectiveness of the
package was equally effective in teaching boys and girls. (v) Students and teachers both
revealed a favorable opinion towards CAI program. The study sites 74 references.

2.2.2 REVIEW OF THE RELATED LITERATURE IN GENERAL SUBJECT

instruction

The study centers upon the problem of the effectiveness of Computer Assisted
Instruction and of the conventional method of instruction in teaching mathematics, in
terms of achievement of mathematics and direction of change in attitude towards
mathematics of male and female students.

Objectives: (i) To study the difference in mathematics achievement which occurs
as a result of the difference in instructional strategy among boys and girls separately and
as a group. (ii) To study the direction of change in attitudes of male and female students
separately and as a group towards mathematics as a result of two different instructional
strategies.

The sample of the study consisted of 220 students from four selected higher
secondary schools, covering the good, average and poor schools of the Bhilai steel plant,
Bhilai (M.P.).

Findings: (i) The students who used the computer scored significantly higher than
those taught mathematics through the conventional method. (ii) The students who used
the computer showed significantly highly favorable attitude towards mathematics than
those who did not use the computer (iii) Achievement in mathematics and change in
attitude towards mathematics were found to be independent of the sex factor.

Rose, A.V. (1992), Effectiveness of the Computer Assisted Instruction with special
reference to underachievers
The study throws light on the application of Computer Assisted Instruction (CAI) and the Teacher Support System (TSS) for the optimum development of underachievers (UA).

Objectives: (i) To develop CAI software (ii) To find out the effectiveness of CAI with TSS and CAI with reference to the learner variable viz. sex, locale, IQ and achievement level and (iii) To find out the interaction of the learner variables and the treatment on the achievement score.

Method: The randomized block design was followed in the selection of the sample, with IQ as the blocking variable. The sample consisted of three group of size 32 each composed of students of standard IX selected from three Tamilnadu State Board Schools covering one rural ad two urban. The underachievers in the sample were identified by using the regression analysis. The tools used included CAI software on “the language of sets”, achievement Test, Cultural Fair, Intelligence Test by Cattell and Cattell, study habits inventory by Patel and Mathematics study Attitude Scale by Sundarajan. Mean, S.D., t-test, chi-square, one way and two way ANOVA were used to treat the collected data.

Findings: (i) Both the CAI strategies were superior to the traditional method of instruction and CAI with TSS was more effective than CAI without TSS for underachievers (UA). (ii) Except achievement level, all the other learner variables combined with the treatment had no interaction effect on the achievement score. (iii) There was no relationship between the post treatment scores and the variable ‘sex’, ‘locale’ and ‘achievement level’ of the experimental group. In the case of the variables IQ, study habits and Maths study attitude, the positive relationship between those variable and achievement at the pre treatment level was found to be cancelled at the post test. Similar results were obtained for underachievers (SP-1779).

Singh R.D. (1992), Effectiveness of teaching Mathematics through Computer Assisted Instruction and conventional method of instruction on cognitive and non cognitive variables

Singh conducted a research on effectiveness of teaching Mathematics through Computer Assisted Instruction and conventional method of instruction on cognitive and non cognitive variables from Guru Ghasidas University as a part of Ph.D. degree.
Singh has discussed the relative merits of teaching Mathematics through Computer Assisted Instruction and conventional method of teaching. Computer Assisted Instruction was always found superior, but the gains were more in the case of good students and there was a definite positive change of attitude towards learning Mathematics on the part of both boys and girls due to the use of computers.

Das A. (1998), *Exploring effectiveness of Computer Assisted Learning Materials on Rhymes in different Modes*

**Objectives:** (i) To develop computer software on rhymes in text, text music, Graphics text, Graphic text music and graphics text music recitation modes. (ii) To study the effectiveness of CALM prepared in different modes for learning the rhymes in terms of word meaning of the students. (iii) To study the effectiveness of CALM prepared in different modes for learning the rhymes in terms of analytical understanding of the students. (iv) To study the effectiveness of CALM prepared in different modes for learning the rhymes in terms of comprehensive understanding of the students. (v) To study the effectiveness of CALM prepared in different modes for learning the rhymes in terms of writing ability of the students. (vi) To study the effectiveness of CALM prepared in different modes for learning the rhymes in terms of recitation ability of the students.

**Method:** Seven different rhymes were selected for the present study. The Baroda High school Bagikahna, an English medium school was selected purposively for the study. Five different groups of pupils of standard 2nd for five different modes of rhyme from the sections were taken on basis of systematic random sampling. Two types of tools were used. One is treatment tool and other is testing tool. A treatment tool was the CALM on rhymes developed by researcher in different modes. The testing tool was an achievement test which was administrated to pupils after they were exposed to CALM on rhymes in different modes. The collected data were analyzed statistically using analysis of covariance (ANCOVA).

**Findings:** Graphics text mode has been found comparatively weaker than the other modes in learning word meaning on rhymes in different modes. The one of the seven rhymes text mode has been found most effective in developing language ability. In the same rhymes, Graphics text music and graphics text mode in developing language abilities of the pupils has been used. In five out of seven rhymes no significant difference
has been found in different modes for developing language ability of the pupils. In three out of seven rhymes text mode largely has been found comparatively weaker than other modes for comprehensive understanding, where as in one rhymes text mode has been found most effective for comprehensive understanding.

Zyoud, M. (1999), Development of Computer Assisted English Language Teaching for VIII standard students

Objectives: (i) To develop a Computer Assisted English language teaching program for standard VIII Gujarati medium students. (ii) To study the effectiveness of the Computer Assisted English language teaching program on students achievement in terms of Vocabulary grammar and comprehension by taking pre test and IQ covariate. (iii) To study the effectiveness of the Computer Assisted English language teaching program on the experimental group students’ achievement of all above mentioned with respect to their intelligence, motivation and attitude.

Method: For the development of the software package four lessons were selected based on opinion of teachers and students regarding difficulty level of these lessons and the difficulty of teaching them. After selecting lessons, content analysis was carried out. Students studying in standard VIII Gujarati medium were taken from two schools to serve as the sample for the study. Students of one school i.e. Rosary School, Baroda formed the experimental group and student of the other school i.e. GEB school, Baroda formed the control group. The tools used in the pilot study were also used in the final experiment namely pre test, Raven’s progressive matrices sets A, B, C, D and E (Raven, 1960). Junior Index of motivation by Frimer (1970) and translated into Gujarati by Dr. Desai (1970) and post test. To study attitude of the students towards the package the researcher developed and administrated an attitude scale on the experimental group only after the final experiment.

Findings: The findings show that when the computer is used to its full potential it can create an atmosphere where the students can learn and interact with the computer without being afraid of the teacher’s presence. The computerized exercise can help the student become familiar with significant amount of vocabulary, grammar and comprehension because it provides effective individualized instruction.
Das, I. (2003), *Computer Education in the Secondary Schools of Assam*

**Objectives:** (i) To assess the attitude of students and teachers towards computer education, infrastructural facilities in the schools and gender disparities in computer science if any, in both Government and private secondary schools of Assam. (ii) To assess the knowledge of the students in computer science, experiences with computers and also the teachers’ educational background and their experiences with computer and (iii) To find out the differences, if any, between the Assamese medium and English medium students of both the Government and private schools in computer education.

**Method:** The sample consisted of 490 students and 16 teachers of secondary schools following the curriculum of computer education laid down by the Board of secondary education, Assam. The study adopted an analytical survey research method. Tools used included attitude questionnaire, achievement test questionnaire for students and teachers and informal discussion.

**Findings:** Students have a positive attitude and outlook, towards computer education received in their respective schools. Some students have suggested a revamping of the traditional modes of teaching by introducing computers in teaching which they think will make their education more exciting and interesting. (ii) Teachers are confident about their knowledge of the subject, they are not devoid of anxiety. Majority of the students’ teacher recognition the important role that computers play in today’s society. (iii) The English medium student found to display higher level of confidence a sense of competences in their approach to and use of computers than the Assamese medium students. (iv) In spite of funding and all other infrastructural facilities provided by the North Eastern council in a collaborative venture with the Board of Secondary Education, Assam, nothing fruitful or lasting evolved from the course of computer education imparted to the students of government schools. (v) Girls have a positive attitude towards computer as being more users friendly and express less anxiety about the use of computers.

Jothikani, N and Thiagarajan, A.P.(2004), *Effectiveness of Computer Assisted Instruction in Mathematics among B.Sc., Degree students*

**Objectives:** To analyze the efficiency of teaching Mathematics to B.Sc. degree students through CAI over conventional method for knowledge, comprehension and
application objectives; (ii) To compare the effectiveness of teaching Mathematics through CAI to B.Sc. degree (Mathematics) students over conventional method in terms of the level of achievement; and (iii) To study the effectiveness of teaching Mathematics through CAI to B.Sc. degree (Mathematics) students over conventional method in terms of objectives of teaching Mathematics and their level of achievement.

**Method:** Two equivalent groups each in I year, II year and III year of Mathematics students were formed based on their achievement score in the previous year. The investigator taught the control group and the experimental group were taught through CAI. ‘t’-test was applied in order to test the significance difference between the mean scores of pre test and post test of conventional and experimental group and to test the significance of CAI over conventional method for the mean gain scores of control and experimental groups.

**Findings:** (i) There is no significant difference between the mean scores of pre test for the control and experimental group in all six units with reference to the objectives such as knowledge, Comprehension and application and their level of achievement such as Low, Average and High achievers. (ii) The mean scores of post test of control group are significantly higher than that of the experimental group in all six units with reference to the objectives and their level of achievement in both the years 1999-2000 and 2001-2002. (iii) The mean gain scores of the control group are significantly greater than that of experimental group in all six units with reference to the objective and their level of achievement in both the years 1999-2000 and 2001-2002. Hence, it is concluded that the conventional method is more effective and efficient than CAI method.


**Objectives:** (i) To develop Computer Assisted Lesson on the topic - UNO in History at higher secondary level. (ii) To test the effectiveness of the Computer Assisted teaching and lecture method of the lesson on the topic - UNO in History at Higher Secondary level and (iii) To verify the impact of gender, domicile and type of school on the effectiveness of Computer Assisted teaching method.

**Method:** The sample consisted of 162 (72 males and 90 females) eleventh standard student from 3 higher secondary schools of Thiruvananthpuram district
randomly selected based on locality of the schools and management of schools. The mean age of the group was 16.54. Out of 162 students 113 were from rural area and 49 were from urban area. 106 students were from government schools and 56 were from a private school in rural area. A pre and post test design was used in the study. Computer Assisted Lesson on the topic UNO in History for higher secondary students and achievement test in History developed by the investigator were used for data collections. The data was analyzed with the help of mean, S.D. and t test of significance.

**Findings:** While both the methods led effective learning, the CAT method was found superior to the lecture method. (ii) It is interesting to note that there is no gender difference in the scores obtained.

Suwana, R. (2004) *Effectiveness of Computer Assisted Instruction for Primary School Students: An Experimental study*

**Objectives:** (i) To know the effectiveness of Computer Assisted Instruction developed by ONPEC for primary school students to learn English language. (ii) To develop Computer Assisted Instruction for primary student to learn Thai language. (iii) To know the effectiveness of Computer Assisted Instruction in learning Thai language developed by the investigator for primary school students. (iv) To know the relative effectiveness of Computer Assisted Instruction developed by ONPEC and by the investigator. (v) To evaluate the both types of Computer Assisted Instruction on the basis of the collected opinion of experts and primary school students. (vi) To provide suggestion to ONPEC for improving Computer Assisted Instruction Program on the basis of obtained data.

**Method:** In the present research, researcher used multistage sampling technique. The investigator selected two cities by purposive sampling technique. Next, the students from standard XI from each school were selected by simple random sampling technique. In each school two groups, each of 30 students were formed. In this way, total 120 students were selected from two schools. The statistical technique t test was used to find out whether the mean scores of each group differ significantly or not. For the analysis and interpretation of data obtained from opinionnaire, mean and standard deviation were employed.
**Findings:** (i) The study has resulted in the development of Computer Assisted Instructional Program on selected five units of Thai language learning for the students of Pratom-3 and five units of Thai language learning for the students of Pratom-6. (ii) The Computer Assisted Instruction developed by the investigator was found significantly effective in learning five topics of Thai subject to the student of Pratom-3 of experimental group – I belong to Buriram Kindergarten (t-value 8.62) (iii) The Computer Assisted Instruction developed by ONPEC was also found significantly effective in learning five topics of English subject to the students of Pratom – 3 of Experimental group – I belong to Buriram Kindergarten (t-value 8.60). (iv) On comparison of mean gain scores obtained for CAI developed by ONPEC in English language with CAI developed by the investigator in Thai language, the obtained t-value is 1.18 (v) The Computer Assisted Instruction developed by the investigator was found significantly effective in learning five topics of Thai subject to the students of Pratom-6 of experimental group-II belong to Buriram Kindergarten. (vi) It was evaluated by teacher as a successful attempt. (vii) Opinion of students was found effective in presenting all the five topics of English and Thai language.

Mehra, Vandana. (2007), **Teacher’s Attitude towards Computer use Implications for emerging Technology Implementation in Educational Institutions**

The purpose of this study was to determine the attitudes of school teachers of Chandigarh towards use of computer technology for instructional purpose.

**Objectives:** (i) To study the attitudes of high school teachers towards computer use; (ii) To study the perceptions of school teachers with respect to computer attributes, level of computer competences and their access to computers.

**Method:** The present study was conducted on 200 government senior secondary school teachers of Chandigarh to explore the teachers’ attitudes of computer use.

**Findings:** The findings revealed the teachers possessed fairly positive attitude towards computer uses but majority of the teachers needs to be provided training for using computers in instructional settings.

Patel, J. A, (2009), **Development and Implementation of CAI to teach English grammar to standard VIII student in different modes**
Objectives: (i) To develop the CAI to teach English Grammar to Standard VIII Gujarat Secondary and Higher Secondary Board (GS&HSEB) students in different modes (only CAI, CAI with repetition, CAI with discussion) (ii) To study the effectiveness of the developed CAI in different modes in terms of students’ achievement in English Grammar. (iii) To study the effectiveness of the developed CAI in terms of the reactions of students. (iv) To study the relative effectiveness of the developed CAI in different modes of presentation (only CAI, CAI with repetition, CAI with discussion) in terms of differences in the adjusted post-test mean achievement of the student in English Grammar.

Method: The sample of the present study was selected purposively. For it two schools of Vadodara namely, Bright day school and Kelvani school during the academic year 2008-09 were selected. From the selected schools 26 standards VIII students of only one division VIII-A of Kelvani School were taken as the Control group and 62 standard VIII students of Bright day school were treated as the experiment group.

The required data were collected with the help of pre-test, post-test and reaction scale which were constructed by the researcher. In between pre-test and post-test the researcher implemented the intervention program in the form of CAI package for ten days for two hours per day on the experiment groups and control group was taught the same topics by their teacher. After the implementation of that the researcher administrated the post-test after the span of fifteen days and the reactions of the students, based on teaching with CAI and the developed CAI itself were taken. The data were collected in three phase.

Findings: (i) The achievement of the students in English Grammar taught through CAI was found significantly higher than that of the students taught through traditional method. (ii) The achievement of the students taught through only CAI was found significantly higher in English Grammar than that of the students taught through traditional method. (iii) The achievement of the students taught through CAI with repetition and CAI with Discussion was found significantly higher than the achievement of the students who were taught through traditional method. (iv) From the three modes of the presentation of this CAI, the mode i.e. teaching through CAI with discussion was
found significantly superior in comparison to other two modes. (v) CAI was also found to be effective in terms of the students.

2.2.3 OBSERVATIONS OF RESEARCHES FROM INDIA

After going through the educational research done in India, the researcher sees the kinds of research were done regarding CAI and CAI with Science. These studies also reveal that teaching-learning become more interesting, joyous and prolonged. This observation can be summarized is as follows:

(i) From the reviewed literature it is clearly seen the CAI is an effective approach and has a great concern regarding learning in Science. It is found that the effectiveness of CAI is compared with traditional method in Science, CAI is superior than the traditional method Jeyamani, P. (1991), Khirwadkar, A. (1998), Kadhiravan, S. (1999), Meera, S. (2000), Dalwadi, N. (2001), Vasanthi, A. and Hema, S. (2003), Dange, J.K. and Wahb, S.A. (2006), Patel, Kinnary. (2008) etc. This research studies were related with topics of branches of science like Physics, Biology and Chemistry at higher secondary as well as secondary level and it shows that well designed CAI is profound in learning.

(ii) Researches by Joshi C.L (1992), Sindhi, N.O. (1996), Phoolwala R.N. (1997), Patel, R. (2001), were conducted to see the effectiveness of the different method in science. These researches have been based on network diagram, microcomputer, multimedia package and CALM.

(iii) Researches by Singh, R.D.; Ahluwalia, S.P.; and Verma, S.K. (1991), Rose, A.V. (1992), Zyoud, M. (1999), Jothikani, N and Thiagarajan, A.P. (2004), Suwana, R. (2004) were conducted to see the effectiveness of CAI in different subjects like Mathematics, English History at different level. Out of these researches only one research conducted by Das, A (1998) was found measuring the effectiveness of the CAI presented in different modes and that too was for teaching Rhymes at lower standard.

(v) Both the methods i.e. CAI and Lecture Method were effective in enhancing the learning. But, on different topics relative effect were shown by both the method. Singh, B. (2005).


(vii) Girls have a positive attitude towards computer as being more users friendly and express less anxiety about the use of computers. Das, I. (2003)

(viii) CAI is effective in comparison of two methods as well as it is found to be effective in different mediums of teaching Jeyamani, P. (1991).

2.3.0 REVIEW OF THE RELATED LITERATURE CODUCTED ABROAD

Lamazares and Ivonne Mercedes, (1991), The effects of Computer-Assisted Instruction on the writing performance and writing anxiety of Community College Developmental Students (Community College Students)

Objectives: (i) Researchers have only begun to ascertain the effects of computer aids on the behaviors and attitudes of writing students, particularly those in developmental college classrooms. (ii) This study set out to investigate whether the writing performance and writing anxiety of developmental community college students could be significantly affected by the use of computers in a networked environment.

Method: The CAI and the comparison groups were administered pretest essays and the Writing Apprehension Test by Daly and Miller (1974). After a semester of process-based writing instruction utilizing the same materials and syllabus, both groups produced paper-and-pencil posttest essays and took the Writing Apprehension Test again. In addition, handwritten posttest essays by the CAI group were compared to posttest essays produced by the same group on the computer.

Findings: A statistical analysis of holistic scores revealed no significant differences between the CAI and comparison groups in writing performance, and no significant differences in the overall performance of the CAI group when writing on the
computer as opposed to using paper and pencil. Analytical scores revealed that the content of the computer essays produced by the CAI group was rated significantly higher than the content of paper-and-pencil essays produced by the same group. Analysis of grammar and spelling, diction, organization and sentence structure did not yield significant differences between the handwritten and computer essays. The CAI group’s writing anxiety became significantly lower than that of the comparison group. Observations by the researcher indicated positive student retention and attitudes toward the computer, and limitations in the study due to lack of technological training and resources. Developmental students did not seem overwhelmed by the new technology or unable to benefit from it, as demonstrated by the significantly reduced writing anxiety of the CAI group, and the significantly higher rated content of the computer essays. These results, though limited in generalizability, warrant further experimentation with developmental writing instruction, that integrates computer networks.

Toet, Joyce Anne. (1991), A Comparative study of two instructional modalities on the achievement level of under prepared Community College Students (CAI)

**Objectives:** (i) This study was undertaken to determine if an Integrated Computer Assisted Instructional system would show superior results measured by increased cognitive gain, when compared to Traditional Instruction methodologies. (ii) A determination of the successful student based on gender, ethnicity, age and prior special education history was undertaken to develop a profile of the successful student in each modality.

**Method:** The method used was a pre/post protocol with experimental and control groups. The sample was randomly selected from a population of nearly four thousand students who took Mott Community College's placement tests. The sample was chosen from those students who were recommended to take remedial/developmental classes in the areas of math, English or reading improvement. Students were pre-tested with standardized instruments (Nelson Denny Reading or T.A.B.E., as appropriate). Demographic variables were examined to determine a profile of the successful student. The study extended over two full semesters and students in the control and experimental classes were assigned equivalent assignments based on time for completion; control from the textbook and experimental classes from work in the Computer Assisted Instructional
laboratory. Equivalency of the groups was tested prior to the beginning of the experiment.

**Findings:** Analysis of final data showed that the experimental groups achieved greater cognitive gains, only Math 021 (basic math) showed differences of a statistically significant level. The analysis showed no possibility of developing a prescriptive instrument for use as a guide for future students to choose either ICAI or traditional classroom instruction based on demographic information and resulting mean cognitive gains. No trends are evident from the analysis of these data. One finding of significant import is the retention rates for ICAI and Traditional classroom methodologies. The results show that students remain in the Computer Assisted Instructional methodology at an increased number to a statistically significant level of alpha .05 in all classes studied (Math 101, beginning algebra, English 098, basic writing, English 020, reading improvement) with the exception of Math 021, basic math.


**Objectives:** (i) To determine the effectiveness of using computer-assisted tutorials and examinations as supplements to the basic lecture and discussion course in macroeconomics. (ii) Secondary considerations included college grade point averages, scores on the American College Test and sex as possible determinants of student learning.

**Method:** The research study was conducted at Cumberland University, Lebanon, Tennessee during the fall semester of 1990. Two sections of Principles of Macroeconomics were used with forty-one students participating. One section performed as the control group and the other section as the experimental group. The computer-assisted instructional materials used were prepared to be used in conjunction with Economics, 11th edition by Campbell R. McConnell and Stanley L. Brue. Six graphics-based tutorials and seventeen exams were completed by students in the experimental group. Students received an on-screen evaluation of their performance showing the percent correct and page references for questions missed.

Effectiveness of computer-assisted instructional materials on macroeconomic understanding was measured by administering four instructor-generated examinations.
and the "Revised Test of Understanding in College Economics, Macro Form B" prepared by the Committee for a College-Level Test of Economic Understanding of the Joint Council on Economic Education which was used as both a pre test and a post test. Secondary data were collected by administering a student questionnaire.

The Ordinary Least Squares Regression model was used to determine the relationship between the independent and dependent variables. The t-statistic was calculated and tested at the .05 and .01 levels of significance.

**Findings:** Results of the regression analysis showed no significant positive relationship between students' cognitive achievement in Principles of Macroeconomics and their use of computer-assisted instruction. The only independent variable that was consistently positively related to students' cognitive achievement in Principles of Macroeconomics was college grade point average. Males were shown to be superior to females in terms of cognitive achievement in macroeconomics.

Gao, Yong Qiang, (1992), *Factors affecting use of Computer-Assisted Instruction by selected Chinese University educators*

**Objectives:** (i) To examine whether identified factors have an effect on use of CAI by selected Chinese university educators. These five factors were investigated: Attitudes toward CAI; language factor; lack of adequate CAI courseware; lack of availability of CAI educators training; and lack of availability of computer systems. (ii) The study also sought to identify the current status and attitudes toward the use of CAI and the relationship between the use of CAI and educators' gender, age, university rank, computer experience, and English level.

**Method:** Subjects were 124 Chinese university educators from 24 different institutions. Among them, 35 attended 1991 Beijing Workshop on CAI in Beijing, China. The remaining 89 subjects attended the 5th National CAI Conference, Nanjing, China. A questionnaire was developed and translated into Chinese in order to collect data from China. Collected data were analyzed through conducting analyses of frequency, percentage distribution, means, General Linear Model (GLM), analysis of variance (ANOVA), analysis of matrix of correlation coefficients, and Scheffe test. Significance was accepted at the .05 alpha level.
Findings: Results of this study indicated a significant development of CAI in China in recent years. Most educators had positive attitudes toward CAI and more than half of them used CAI in their teaching. The study also found statistically significant differences between use of CAI and age and English level; age, rank, and computer experience were also correlated to use of CAI; all 5 factors examined in this study were statistically significant related to use of CAI. Based on the findings of the study, recommendations were made for improvement and future research on CAI in China.


Objectives: To assess the effects of cooperative learning and individual learning with Computer Assisted Instruction (CAI) in a university-level introductory chemistry course. (ii) To assess the cooperation on group work and positive attitude toward using computers in the classroom.

Method: The sample consisted of 109 students who enrolled in an introductory chemistry course (CH 301). These subjects were assigned to one of four cells in a two factor experimental design. The two factors were learning group and learning ability-level. Within the learning group factor, there were the two groups: cooperative working groups and individual working groups with a computer. Subjects in cooperative learning groups worked in dyads and individuals worked alone with a computer. Within the ability level factor, there were the two levels: the high-ability groups and the low-ability level groups. All participants worked a minimum for one hour per week. They attended a lecture class first, and then worked with chemistry computer programs in the computer lab.

Findings: Subjects who participated in cooperative learning performed their achievement better than subjects in the individual learning groups with Computer Assisted Instruction (CAI) in an introductory university-level chemistry course. High-ability level students and low-ability level students in cooperative learning group improved their performance more than high-ability or low-ability level individuals who worked alone with a computer in an introductory university level chemistry course.
There was no significant difference on students' attitude between students who worked in the group use of computers and individual use of computers in an introductory university-level chemistry course. The majority of the students in the university level class showed positive co-operation on group work and positive attitude toward using computers in the classroom.


Objectives: (i) To examine the effectiveness of Computer Assisted Instruction (CAI) versus traditional instruction on the academic performance of adult students on the mathematics and reading sections of the Test of Adult Basic Education (TABE). (ii) This study investigated the independent influence of the variables age, gender, income, marital status, educational level, ethnicity and employment status on the academic performance of adult students on the total section of the TABE.

Method: A combination of a Nonequivalent Control Group Design and a Causal Comparative Design was employed in this investigation. Two-hundred (200) adults from the Vocational Technical Adult Basic Education Center in Southeast Mississippi were selected to participate in this empirical study. The "Test of Adult Basic Education" was used to collect the data. The instrument was judged to have good content validity. Internal consistency reliability coefficients ranging from .88 to .91 and .87 to .92 were computed on both the math and reading sections of the TABE D and M, or Forms 5 and 6, respectively. Moreover, the data were treated through the application of the One-Way Analysis of Covariance, One-Way Analysis of Variance, and the Scheffe' follow-up test.

Findings: (1) The type of instruction had an influence on the academic performance of adult students on the math and reading sections of the TABE. (2) Adult students' age had no effect on their total scores on the TABE. (3) Male and female adult students had similar scores on the total section of the TABE. (4) Ethnicity had some influence on the academic performance of adult students on the total section on the TABE. (5) The more formal education adult students had obtained, the higher their scores were on the total section of the TABE.
Rivet, J.R. (2001), **Students achievement in middle school Mathematics: Computer Assisted Instruction versus traditional Instruction**

**Objectives:** To examine changes in student achievement in middle school Mathematics on operations involving Fractions when computing two instructional strategies. The research questions in the study address the issue of student achievement, retention and cost effectiveness.

**Method:** Four 6th grade classroom were identified, two classroom within each of two middle schools. Two classrooms used Computer Assisted Instruction as the primary means of content delivery involving Mathematical concepts all pertaining to the content area of Fractions. Within the same content area, the other two class rooms’ primary mode of instruction remained the lecture and textbook. A quasi experimental pre test post test design was used. Following a six week study, difference scores were examined to substantiate the primary hypothesis that the use of Computer Assisted Instruction led to increases student achievement when compares to traditional instruction techniques.

**Findings:** In spite of variability in performance in individual types of fraction operations, the overall improvement scores were significantly greater in Computer Assisted classrooms than in the traditional classrooms. Further, in spite of the achievement difference between schools, the Computer Assisted classrooms performed better than the traditional classrooms at each school. Although the statistical analysis conducted revealed that there were no statistically significant difference rates between Computer Assisted Classrooms and traditional classrooms, in spite of marginally lower attendance rates in the Computer Assisted classrooms, overall improvement scores were significantly greater in Computer Assisted classrooms than in the traditional classrooms. In this study, students in the traditional classrooms on average improved 3 points on the 30 points post test while students in the Computer Assisted classroom on average improved 4 points. This signifies a 33% achievements benefit. Thus, 33% increase in student achievement was gained in classrooms utilizing Computer Assisted Instruction as opposed to those utilizing traditional instructional technique.

Hodge, J. E. (2002), **The effect of Math anxiety, Math self-efficacy and Computer Assisted Instruction on the ability of undergraduate nursing students to calculate drug dosages**
Objectives: To study the effect of Math anxiety, Math self-efficacy and Computer Assisted Instruction on the ability of undergraduate nursing student to calculate drug dosages.

Method: The population of the study consisted of undergraduate nursing student at Mountain state University (N=122), while the sample included students enrolled in Math topics for Nurses course during the spring Semester of 2002 ( N = 40). Participants completed the Math Anxiety Scale (MAS), Math Self-Efficacy Scale (MSES) and a Drug Dosage Calculation Exam, Fennema and Sherman (1976) created the Math Anxiety Scale (MAS) while Betz and Hackett (1989) designed the Math Self-Efficacy Scaled. The researcher and panel of expert created the Drug Dosage Calculation Exam. All students attended didactic lecture on oral and parental drug dosage calculations, as well as one on intravenous flow rates. After each of the three lectures, students attended either a traditional classroom of a computer lab to reinforce these concepts.

Findings: Although data analyses indicated that Math anxiety was a factor in nursing students’ ability to calculate drug dosages, it was not statistically significant. On the other hand, Math Self Efficacy and Computer Assisted Instruction showed statistically significant relationships with undergraduate nursing students’ ability to calculate drug dosages. Nursing educators must be aware of factors that effect drug dosage calculation abilities and posology errors including Math anxiety, Math Self-Efficacy and method of Instruction.

Hsu, Yung-Chen (2003), The effectiveness of Computer Assisted Instruction in Statistics education: A meta-analysis

Objectives: To investigate the effectiveness of Computer Assisted Instruction (CAI) in statistics education at the college level in the United States.

Method: This study employed meta-analysis to integrate the findings from 25 primary studies, which met a specific set of criteria. The primary studies were selected from journal articles, ERIC documents and dissertations.

Findings: Results of the meta-analysis indicate a small to medium positive effect of applying CAI in teaching college level introductory statistics on students’ achievement. The result of the analogous analysis of the variance showed that different modes of CAI program produced significantly different effects on students’ achievement.
in learning statistics. Expert systems and drill and practice programs were the most effective modes and were followed by multimedia, tutorials and simulation. Computational statistical packages and web-based programs were the least effective modes. The teacher made CAI programs were significantly more effective than the commercially developed CAI programs. The effectiveness of CAI program in teaching statistics did not differ significantly according to the study characteristic of the publication year, the publication score, the educational level of participants, the level of interactivity of CAI program, the instructional role of CAI program and the sample size.


Objectives: (i) To examine the effects of incorporating Computerized Instruction developmental Mathematics courses. (ii) To study examined achievement, retention, persistence and success of students who began in elementary algebra, progressed into Intermediate Algebra and subsequently obtained their goal of completing an initial college level Mathematics course.

Method: Two groups of elementary algebra from Chattanooga State Technical Community College were used in this study. One group was taught using a lecture based approach and one group was taught using a computerized instructional approach. The lecture group consisted of 175 students where the computer group consisted if 208 students.

Achievement was studied using elementary algebra final exam grades and overall course grades from students who were enrolled in elementary algebra during the fall 2002 semester. Retention was studied using students who began in the fall 2002 semester in elementary algebra, tracking them, to see if they enrolled in a Mathematics course during the spring 2003 semester. Persistence was studied using students who began elementary algebra in the fall 2002 semester, enrolled in a Mathematics course during the spring 2003 semester and persisted with their Mathematics by registering for a mathematics course in the summer 2003 semester or the fall 2003 semester. Student success was studied using students who began in the elementary algebra course in the fall 2002 semester and successfully completed a college Mathematics course by the fall 2003
semester. Success was determined by the number of students who made a letter grade of an A, B or C in any college level Mathematics course.

Findings: When examining achievement, retention, persistence and success, the only area in this study that showed a significant difference was among the achievement rates. The lecture students’ achievement rates were significantly higher than the students who received computerized instruction. Retention, persistence and success did not show any significant difference between the two groups.


Objectives: To describe the effect of a Computer Assisted Instruction program had on the Mathematics achievement of ninth grade high school students in the lower Rio Grande Valley as measured by the state assessment.

Method: A quasi experimental pre test post test control group design with matching was used. The subjects were first time, non-exempted ninth grade students from two schools paired by ethnicity and percentage of socio-economically disadvantaged. The experimental group utilized a commercially available Computer Assisted Instructional program in addition to instruction as described in the Academic Excellence Indicator System (AEIS) and according to instruction as District curriculum guidelines. The control group utilized only instruction as described in its Academic Excellence Indicator System (AEIS) and according to District curriculum guidelines. Spring 2003 eighth grade Mathematics state assessment, Texas Assessment of knowledge and skills, served as the pre test for both groups. Spring 2004 ninth grade mathematics state assessment, Texas assessment of knowledge and skills served as the post test for both groups. ANCOVA procedures were used to determine the statistical significance.

Findings: There is a statistically significant difference between the Mathematics achievement of ninth grade high school students in the lower Rio Grande Valley who have participated in Computer Assisted Instruction and the Mathematics achievement of ninth grade high school students in the lower Rio Grande Valley who did not participate in Computer Assisted Instruction. The resultant analysis indicated that there was
statistically significant difference between the Mathematics achievements of the two groups.


**Objectives:** To examine the effect of Computer Assisted Instruction (CAI) in the reading skill of emergent readers in Kindergarten classes at select Reading First schools in the School District of Palm Beach Country, Florida. (ii) To analyzed teacher attitude towards the computer affected student reading achievement.

**Method:** The measure used to compare treatment and non treatment schools were the Dynamic Indicators of Basic Literacy Skills (DIBELS), which tested letter naming ability, initial sound identification, phoneme segmentation ability and nonsense word decoding. The Word Recognition and Reading Running Record assessments form the School District of Palm Beach Country Reading and Writing Assessment System Grades K-1 protocol booklet tested identification of 25 sight words and ability to read continuous text.

**Findings:** Students using Destination Reading (Riverdeep, 2001) did not benefit significantly from the use of the program compared to nonuser. The CAI group scored significantly lower on the initial sound fluency measure. Factorial ANOVA were used to compare DIBELS scores for effectiveness of the treatment, pre and post test comparisons and interaction of treatment with test scores for the CAI compared with the nonuser group. T distributions were used to analyze data from the Reading Running Record and Word Recognition assessments. There were no significant differences between the CAI and comparison schools on these two measures. Teacher attitude toward computer did not affect students’ acquisitions of reading skills, as survey responses were in the positive range for all participants.


This paper describes the educational use of CAI in two different courses at a small, private university and the implementation and use experiences of the instructors.

**Objectives:** (i) To study the impact of using CAI on student evaluations of both the course and the instructor and on student grades. (ii) To evaluate, mean responses
compared on questions influenced by the switch from traditional homework assignments to CAI-based homework assignments.

**Method:** Data was obtained from student course evaluations, homework scores, and final exam scores for the principles of microeconomics and the principles of financial accounting courses. The total number of macroeconomics sections in the data set was 17 (6 sections before CAI and 11 after CAI). The total number of accounting sections in the data set was 6 (2 sections before CAI and 4 after CAI). The sample size was 311 for the microeconomics course and 95 for the accounting course.

CAI represents the homework score achieved by the students in each of the courses. SPRING controls for possible differences in final exam scores between fall and spring semesters that might result because weaker students often are advised to take these courses in the spring semester. Because CAI was used in the microeconomics course for two years, a TIME variable was included to examine whether the use of CAI is more effective over time. The effect of CAI on final exam scores is expected to be positive and was examined by regressing the final exam scores on the homework scores (the Aplia score in the microeconomics course and the Homework Manager score in the financial accounting course), while controlling for SPRING (both courses) and TIME (the microeconomics course only).

**Findings:** The means of the variables used in the regressions for the final exam score (FINAL EXAM). Of interest in this study, while the average FINAL EXAM scores are quite different (67.09 for microeconomics vs. 49.28 for financial accounting), the average CAI scores are almost identical (74.33 for microeconomics and 74.97 for financial accounting). This may suggest that the mechanics of using a CAI tool does not significantly impact the outcomes achieved by students.

With the exception of SPRING, all of the variables tested are significant at the 1% level. The intercept terms for both courses (21.901 and 25.438) are consistent. The results for the CAI variable are, as expected, both positive and significant and indicate that the use of CAI improves final exam scores. For the microeconomics course only, the TIME variable is both positive and significant and added 4.846 points to the final exam score in year two compared to year one. This indicates that with instructor experience, the use of CAI may be more effective over time.
Regression results indicate that CAI was not significant in explaining the responses to any of the 10 student evaluation questions chosen. This suggests that the use of CAI, in and of itself, does not impact student perceptions of course quality. Alternatively, this may be due to the fact that the responses are not identified by student, so the aggregated data masks any effect of CAI on student perceptions of course quality. While the response differences are not large enough to be significant, at least for the microeconomics course, they generally are positive indicating a possible improvement from the use of CAI in student perceptions of course quality.

2.3.1 OBSERVATIONS OF RESEARCHES FROM ABROAD

Most of the studies conducted in abroad were related to the integration of the CAI with various subjects and technology either at school level or university level. Many researches found following experimental design following quasi experimental design. The findings can be summarizing as follows:


The teacher made CAI is more effective than the commercially developed CAI programs. Hsu, Yung-Chen (2003).

Analysis of the experiment showed that the experimental groups achieved greater cognitive gains. Even the students remain present in more number in CAI class room. Toet, Joyce Anne. (1991), Males were shown to be superior to females in terms of cognitive achievement. Haley, Mary Lewis Purnell. (1991).Most educators had positive attitudes toward CAI and more than half of them used CAI in their teaching. Gao, Yong Qiang, (1992). The majority of the students in the university level class showed positive co-operation on group work and positive attitude toward using computers in the classroom. Park, Insun Hwang (1993). The type of instruction had an influence on the academic performance of adult students on the math and reading sections Burton, Beatrice Spencer, (1995).
The overall improvement scores were significantly greater in Computer Assisted classrooms than in the traditional classrooms. The Computer Assisted classrooms performed better than the traditional classrooms at each school. Rivet, J.R. (2001).

Computer Assisted Instruction showed statistically significant relationships with undergraduate nursing students’ ability to calculate drug dosages. Hodge, J. E. (2002).

The meta-analysis indicates a small to medium positive effect of applying CAI in teaching college level introductory statistics Hsu, Yung-Chen (2003). The lecture students’ achievement rates were significantly higher than the students who received computerized instruction. Cannon, T. R. (2005).

2.4.0 IMPLICATION FOR THE PRESENT STUDY

The advances we are witnessing in the various fields of scientific endeavor are truly spectacular. Underlying this progress is the all out commitment of modern industry to research as the foundation for growth and indeed for survival. Progress in education has been far less impressive and the question is whether we can equip the students we are now teaching to live in this rapidly moving world. Over the last few decades we have attained a much better understanding of the child as a developing organism, of the learning process, and of the role of the education in promoting his/her maximum growth. We have made a definite worthwhile progress and no longer in the sea of ignorance but can locate area of knowledge and can explore the fair idea to grow.

This research was developmental cum experimental hence it’s an effort to find out efficacy of the CAI package. With the advancement of the technology and fast growing information highway many computer program are professionally available. Such programs are not suited as per the age of the student even not the content of the book is properly explained. Many software relevant to the content available in large number on the internet, which also found to be inconvenient from the theoretical point of view of the book. Such micro and abstract phenomenon in physics need special attention. By considering all regarding the present research to develop and to check the effectiveness of CAI program has been carried out.

In India and abroad various computer mediated program are developed. These programs are in other subject than in Physics, they are either in Biology, Chemistry, in
medical sciences and mathematics or in languages. Secondly comparatively very few experimental comparative researches with development of package are done. Specifically in abroad such experiment work done for college students and they are mostly in mathematics. The research done in India in physics with CAI is for the student of Secondary level. The experimental work done with CAI for the student of higher secondary is for class XI. The researches done before are for the old syllabus. After implementation of the new syllabus in XII science physics not a single research work found related to this research work. The statistical analysis carries through ANCOVA and two covariate are used for the calculation. This research work also provides the insight to the student to think or to have a concept regarding other abstract topics. It makes possible of transfer of knowledge in the same and other subject and provide conceptual frame work.

Thus it reveals the importance and need of the present study. These will pushing back the frontiers of teaching-learning physics. Very few studies are carried out in the field of physics; they are of Jeyamani (1991), Kadhiravan S. (1999) and Patel K. (2008). As no study was found related teaching of Physics-Optics to Gujarati medium student with the help of CAI in different modes for XII Science student, it carries its own importance.