CHAPTER II

REVIEW OF RELATED LITERATURE

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2.0 INTRODUCTION

The chief objective of any research endeavour in reviewing related literature is to justify the rationale of an ensuing study. The off-shoot contribution of such an activity has many holds. It provides an over view of historical perspective, the development of research in that area, deviations, new departures, and mode of approach adopted. In a way, it brings to light, the research trends and problems, critical awareness toward the methodology employed; and an estimation of relationships working behind the variables. And finally the review helps in providing placement and direction for the study to be fitted into its existing body of knowledge. With this end in view, review of related studies have been classified under the following headings.

(1) Computer-Assisted Instruction and writing (word processor).

(2) Computer-Assisted Instruction and reading.

(3) Computer-Assisted Instruction and vocabulary.

(4) Computer-Assisted Instruction and grammar.

(5) Attitude towards Computer-Assisted Instruction.

(6) Teaching English as a second/ foreign language through Computer-Assisted instruction.

(7) Effects of Computer-Assisted Instruction on students' achievement.

2.1 COMPUTER-ASSISTED INSTRUCTION AND WRITING (WORD PROCESSOR)

Many studies have been conducted to study the effect of word processing on writing. The areas investigated were as follows:

1. Word Processing effect on revision.
2. Word Processing effect on students attitude towards writing.

2.1.1 WORD PROCESSING EFFECT ON REVISION

Many studies have been conducted to study the effect of word processing on students' revision at college and school levels. The studies are calssified under the following headings.

(1) Word Processing effect on college students' revision.

(2) Word Processing effect on primary school students' revision.

(3) Word Processing effect on secondary school students' revision.

2.1.1.1 WORD PROCESSING EFFECT ON COLLEGE STUDENTS' REVISION

Collier (1983) studied the effect of computer-based text editors on the revising strategies of inexperienced writers. Four subjects (all female) from introductory composition courses participated in the study. The result of the study indicated that the use of a word processor for revising purposes did not enhance the quality of their written products.

Harris (1985) investigated the effect of word processing on revision. Six students writers were selected from an honors freshman English course and an advance composition course. Result of the study indicated that using a word processor seems to discourage revision.

Hawisher (1986) conducted a study to discover not only whether students revise more extensively with the computer than with pen and typewriter but also whether they revise more successfully. Twenty advanced college freshmen enrolled in a required writing course participated in the study and divided into two groups of ten students each. Results of the study suggested that "writing on a computer does not lead to increased revision, at least not for these academically advanced students." Word processor students did not produce more

revision nor better revision than pen and typewriter students.

Coulter (1987) conducted a study to determine if word processing use had an effect on students' writing and cognitive development. 62 college freshmen composition students divided into two groups of 31 students each who were matched in terms of composition instructor and cognitive stage. Results of the study indicated no significant differences between word processing and non word processing students in writing quality, frequency of revision, or type of revision used. It was concluded that word processing use by students writers in this setting had no effect on writing quality or revision strategies, while it may have some small effect on cognitive development.

Schipke (1986) conducted a study to evaluate various pieces of writing from idea to completion in order to investigate the long term planning and revision process of two professional writers. Results of the study revealed that although the technology allowed for the use of assembling, it did not appear to have a dramatic effect on either the writing style or the thought process of the writers.

Lutz (1987) conducted a study using text processing (computer) and pen and paper protocols to compare the

changes made by four professional writers and three experienced writers as they revised their own work and edited texts written by other authors. The results of the study indicated that there were no significant differences in approach between professional and experienced writers. There were significant differences between writers using the computer and the pen and paper modes.

Flammia (1989) examined the effect a word processor had on the number and type of revisions made by basic writers and the effect it had on the quality of their essays. 28 students in two sections of a basic writing course at a large state University divided into control and experimental groups participated in this study. Results of the study indicated that there was no difference between the essays produced by the experimental group and the control group. No relationship was found between prior word processing experience, level of word processing skill, or attitude toward writing and the quality of essays produced by the experimental group.

Smith (1994) investigated the usual composing and revision processes and strategies of twenty-one L1 English and ESL students writers and the processes these same writers use after Grammatik IV, a computer usage checker, has been added to the writing situation. The

results of the study showed that the usage checker negatively affects both the revision strategies and products of the basic writers of both language groups and has a negligible effect on the strategies and products of both language-affiliated skilled writers.

Litten (1990) conducted a study with two purposes, one purpose was to investigate the relationship of teacher and peer criticism on the revision process of freshmen college composition students who wrote a persuasive essays. The second purpose was to describe the effect of word processing and traditional writing tools on the revision process of the same students. 107 students divided into four groups (1) teacher review with word processing (2) peer review with word processing (3) teacher review with traditional writing tools (4) peer review with traditional writing tools. The result indicated that word processing had no effect on quantity or quality of revised text.

Bean (1983) conducted a study to learn about word processing technology and to be able to revise with word processor. Twelve instructors and four freshman composition students participated in the study. The results of the study indicated that the computer can help beginning writers learn to revise their initial drafts with less emphasis on progressive reshaping of

ideas through successive drafts. The computer can be a substantial benefit for beginning writers.

Givner (1988) investigated the use of word processing in the development of adult basic education students' composition skills. Four adult basic education students participated in the study. Results of the study indicated that the number of errors per 100 words decreased across drafts for each composition task. Generally, subjects revised their drafts at a surface level, correcting punctuation and spelling. The results of interviews and daily observation indicated that subjects had a positive attitude toward word processing for revising and perceived it as having helped them improve their writing.

Deming (1987) investigated the effect of the Bank Street Writer word processing programme on basic college writers' revision strategies, writing apprehension, and writing quality while they composed expository essays. 24 best typists in two developmental studies classes divided into two groups of 12 students each. The results significant at .05 level, indicated that word processing affects the mean vector of revision types, writing apprehension, and writing quality. The results also show that word processing affects microstructure revisions but does not affect writing quality or writing apprehension.

Mcallister et al. (1988) conducted a study to discover whether basic writers revised more successfully with a word processor than with pen and paper. 102 college basic writers divided into three groups, two experimental and one control group. The results of this study indicated that word processing does have a positive effect on the quality of revision in basic writers.

McCarthy (1989) examined the effect of computers in the revision practices of college composition students. Eleven freshmen composition students at Miami University participated in the study. Results of the study revealed that the computer has the capacity to alter revising practices and writing strategies, but that its presence by itself is not enough to alter those strategies or make students revise more.

Pennington et al. (1989) conducted a study to assess the utility and effectiveness of text analysis and word processing in ESL composition. Four non-native university students participated in the study. Two of the students revised their compositions based on surface oriented feedback from a text analysis programme reinforced by a tutor, and the other two revised according to an approach combining word processing and process oriented input from the same tutor. The results of the study indicated that use of word processing seems

justified as a medium for enhancing the creative revision process of ESL students, while use of text analysis with the same population of students is less obviously justified.

Bernhardt et al. (1989) conducted a programme evaluation study at Southern Illinois University Carbondale to assess the broad, measurable effects of using computers to teach introductory college composition. A total of 24 classes were studied, 12 control classes and 12 experimental classes. Results of the study favored the use of computer. With computer, students revised and improved their post-test essays at level significantly better than those of regular students. Those students in experimental section who chose to compose on computer, at the end of the term out performed the group as a whole and performed significantly better than those experimental students who chose to compose with pen and paper. Attitudinal data from both students and teachers also favored the use of computers.

2.1.1.2 WORD PROCESSING EFFECT ON PRIMARY SCHOOL STUDENTS' REVISION

Boone (1986) investigated the revision behaviours of third, fourth, and fifth grade students who used a word processor as an integral part of the writing process. The

revision behaviours of 10 children were documented. Results of the study indicated that the children incorporated more revisions with the body of existing text as opposed to adding onto the end of a composition. Children preferred the word processor medium to writing with pencil and papers.

Moore (1987) investigated the effects of word processing technology in a developmental writing programme for 204 fourth and fifth grade students. The study focused on implementation of the programme and its effects on writing quality, attitude towards composing, and revision characteristics. A pre-test-post-test quasi-experimental design was followed. Students were divided into two groups, experimental and control. The results of the study revealed that students using word processor improved their writing quality significantly more than students not using word processor ($p<.10$). The results of the analysis of revision characteristics of eight students suggested that. (a) The four students using word processors increased the length of their final drafts and revised frequently, including many meaning related revision changes, and (b) the four students not using word processors increased the length of their final drafts slightly and only made a few revisions which were primarily surface-related changes. The four students using word processors made significantly more revision

changes and significantly more meaning related revision changes when compared to their peers.

Grejda (1989) conducted a study to determine the effects of word processing on (1) the overall writing quality of beginning writers; (2) recognition and revision of mechanical and organizational writing errors; and (3) revision skills of students of different abilities. 66 sixth-grade students who were randomly assigned to three treatment groups: one revising exclusively with paper and pencil, one with computer word processing; and one with a combination of the two techniques. The results indicated a significant difference among treatment groups supporting research that word processing can help students revise more skillfully. Significant differences were found in favor of the word processing group in organizational revision on both the original and standard compositions and in mechanical revisions on the standard composition versus both the paper and pencil and combination groups. Word processing students tended to correct more first draft errors and to make fewer new errors than their counterparts in the other treatment groups.

Steelman (1991) conducted an intervention study to implement and evaluate a writing programme for middle level students. Computer facilitated revision strategies

(reflection) important to the writing process and cognitive development. The pretest-posttest study employed a non-equivalent control group design with two experimental groups (E1 and E2) and one control group (C1). Seventy-five sixth graders were randomly assigned by race and gender to the three groups. E1 used computers to write a school newspaper; E2 wrote the newspaper without computers; and C1 was involved in "traditional" writing curriculum. The researcher hypothesized that E1 would perform better than E2 and C1 on all measures and E2 would out perform C1. Analyses of the data revealed significant differences for several of the dependent variables including writing quality and quantity. The type of revision strategies employed differed among the groups.

Hagler (1994) investigated the effects of the word processor on the revision behaviors and quality of writing of 6th grade students. The design of the study was a two-group pretest/posttest; one group wrote documents using paper and pencil; another group wrote documents using the word processor. Results of the study indicated that students using word processors as part of the writing process were freed from the time consuming task of recopying their work, which allowed them to revise in ways that resulted in increased T-unit length.

Students who used paper and pencil made more substance-type revisions and more revisions for the purpose of altering the topic.

Harvey (1992) investigated the effects of word processing on the revision strategies of fourth, sixth, and eight graders from a rural school who were taught keyboarding and word processing for twelve weeks. Finally, they wrote on three topics with half the students using word processor and half using pencil. The results of this study indicated that word processor is well suited for the process approach to writing, particularly in the areas of revisions and collaboration.

Beesley (1987) studied the effects of word processing in the elementary composition classroom with the objectives to compare (a) a group of sixth graders' writing and revising strategies when utilizing word processors and pen; (b) the length, error, and quality of the students' written products when using word processors and pen; (c) the students' attitudes toward writing and revision with word processors and pen. Twenty-three sixth grade students assigned to the researcher served as the population of the study. Results of the study showed that when word processing, students were found to make more of certain kinds of revisions per word written, although generally, the revisions were lower-level changes, the

same types they made when composing with pen. T-test showed virtually no significant differences between products composed with pen and those composed with computer. Most students felt their writing and revising strategies and the quality of their stories remained the same regardless of composing tool.

2.1.1.3 WORD PROCESSING EFFECT ON SECONDARY SCHOOL STUDENTS' REVISION

Anderson (1984) examined the use of electronic word processing in teaching eighth-grade students to revise. Experimental design was established by using a control group and an experimental group in a pre-test, treatment, post-test setting. Results of the study showed that the experimental group demonstrated a significant greater number of changes in their post-test essay over their pre-test essay. Pre-and post-test scores for quality did not show a significant difference. The conclusion was that using the computer did help these eighth-grade students learn to make changes in their writing.

Owston et al. (1992) examined how writing with word processing influenced both the composition process and quality of work produced by eighth-grade students and examined the influence of word processing on the writing quality and revision strategies of those eighth grade students. Four classes of eighth grade students (N=111)

from a K-8 public school participated in the study. Results of the study showed that papers written on computer were rated significantly higher by trained raters on all four dimensions of a holistic/analytic writing assessment scale.

Duling (1986) conducted a study in order to answer the following questions. Does the introduction of word processors in a secondary English classroom affect students revision, correction of errors , fluency, and quality of writing? Students in a ninth grade English class participated in the study. Results of the study revealed that students made significantly more revisions at the sentence and multi-sentence level of their texts than expected. They had fewer uncorrected punctuation and capitalization errors using the word processors. There was no difference in the judgment about the quality of writing of the students papers whether hand or computer revised. Lack of typing proficiency was an obstacle to the students fluency.

Baggarley (1992) examined the effects of the use of word processing on seventh grade students' writing revision and writing quality. Experimental control group design was followed. The subjects were 96 seventh grade students from two schools. The experimental group used the word processor while the control group used pencil

and paper for writing assignments. The findings of this study indicated that writing and revising exclusively with a word processor does not increase revisions either low level or high level. Both below average and above average students benefit from the use of a word processor as a writing tool.

Joram et al. (1992) conducted a study to investigate the hypothesis which says that more frequent revising throughout composing with word processor might interfere with the constructive processes of composition, and also to find out if writing skill would make a difference in these predicted effects. Participants of the study were 10 male and 12 female grade eight students. Fifteen students were above average writer and 16 were average writer. Results of this study showed that papers produced with word processor were not rated as higher in quality than those written with paper and pencil. The average students writers produced their most creative papers when composing as usual on a word processor. The result of this study suggest that the effects of word processor interact with individual students differences.

Walther (1989) investigated the interaction between two common instructional methods, the use of editing questions and the use of models-and word processing in the revisions of twelfth grade students. 33 twelfth-grade

students wrote four essays under four different conditions: word processing with model essays, word processing with editing questions, non word processing with model essays and non word processing with editing questions. Results of the study indicated that the use of word processing does affect the students composition process but will not necessarily improve the quality of the student's writing or the quality of students' revisions.

Green (1989) conducted a study to test the hypothesis that there is a positive correlation between the number of substantial revisions in essay writing done on a computer and the quality of the compositions. Twelfth grade public high school students enrolled in an advanced college credit programme participated in the study. The statistical analysis showed that there was no correlation between the substantial revisions made by each writer and the quality of each of the essays. The results of a questionnaire indicated that the students developed a positive attitude about computers as writing tools, espicially because they facilitate revision.

2.1.2 WORD PROCESSING EFFECT ON STUDENTS' WRITING AND ATTITUDE TOWARDS WRITING

Rodrigues (1985) conducted a study to teach college basic writers how to use the word processor effectively.

Twelve college basic writers participated in the study. Results of the study showed a definite attitude improvement when writers used the word processor, but could not report any substantive change in quality of writing caused by the word processor.

Phinney et al. (1990) conducted a pilot project in which ESL students in a university freshmen composition class used microcomputers to write. Seven freshmen composition class students participated in the project. Results showed that positive reaction to writing with computer, essay editing and time saved were appeared to all. Using the computer had improved the writing of many of them, and also improved their attitudes to writing.

Thaipakdee (1992) investigated the relationship of word processor used by foreign college writers and their attitudes toward writing; writing revision practices, writing quality, attitudes toward the use of computers, and time spent on computers. Twenty three of 26 foreign college writers enrolled in the technical writing class during the spring 1991 semester at the university of North Texas were subjects in this study. The results indicated that students' attitudes toward writing and their perceptions of computer usefulness significantly affected their writing quality. Students with more positive attitudes toward writing and the usefulness of

computers tended to produce better quality. In addition, the findings indicated that students' writing revision practices significantly affected their attitudes toward writing. Students who revised their writing more frequently tended to have better attitudes toward writing than those who did not. Furthermore, the amount of time that students spent on computers did not significantly affected their attitudes toward using computers in writing.

French (1992) conducted a study with the purpose to address the effect of using word processing on the writing performances and attitudes of adult (N=18) and traditional age (N=36) college developmental writing students and focused particularly on the adult students. The study was conducted at Fairmont State College, Fairmont, West Virginia. Data collection took place at the beginning, midpoint, and end of the study. The results suggested that use of word processing in a developmental writing class using writing process-based instruction and writing practice, is effective in improving the writing performance and attitudes of adult and traditional aged students.

Hall-Molina (1991) conducted a study with the purpose to determine whether there were differences evident when comparing students who used word processing and students

who used the paper and pencil method of composition when looking at three related areas of the composing process: the students' attitudes toward writing, the quality of their writing, and their ability to perform problem solving tasks. The subjects were fifty-five fifth and sixth grade students. Four research hypotheses were tested. Results of the study indicated that significant differences between the two groups were not noted, and all four of the hypotheses were rejected.

Espinoza (1993) conducted a quasi-experimental study to evaluate and compare the effectiveness of three approaches to improving writing in the reading classroom and to examine the students' attitudes toward writing. Six sixth grade reading classes were participated in the study. Independent variables were method of treatment, language level of students, and home language of students. Dependent variables were writing achievement, scored holistically and analytically, and attitude toward writing. The six classes were divided into three treatment groups; WP + (using a spell and grammar checker-enhanced word processing software programme), WP (using the same software programme without the checker options), and P&P (using pen and paper). Results of the writing and the attitude surveys were analyzed by analysis of covariance, using pretest writing scores as covariate. Five null hypotheses were investigated, two

were rejected and three were retained. Significant differences attributable to treatment were determined between students using enhanced word processors and those using pen and paper, and English home language students and those from bilingual home background. Areas where there was no indication of treatment effects were writing achievement of low-language ability students and those who were not low, and students attitudes toward writing.

The above literature reviewed reveales that in majority of the studies Word Processing had no effect on college students' revision. However, the effect of Word processing could be seen on students' revision at primary and secondary level.

2.2 COMPUTER-ASSISTED INSTRUCTION AND READING

Many studies conducted to study the effects of Computer-Assisted Instruction on reading have been reviewed and presented here under the following headings.

(1) Computer Assisted Instruction effects on reading achievement.

(2) Computer Assisted Instruction effects on reading comprehension.

2.2.1 COMPUTER ASSISTED INSTRUCTION EFFECTS ON READING ACHIEVEMENT

Taylor (1984) examined the effects of computer-assisted instruction (CAI) on the reading achievement of college students enrolled in a developmental reading programme. Forty-one students participated in the study. A three groups, pretest-posttest experimental design was used for the conduct of the research. One control group consisted of eleven students received traditional instruction only. Two experimental groups, the first experimental group comprised of sixteen students, received twenty five minutes of traditional instruction and twenty five minutes of CAI during the fifty minutes class period. The second experimental group, consisting of fourteen students, received traditional instruction in the same manner as that of the control group, but also received CAI instruction outside of the classroom. Results of the study revealed that after adjustment had been made, mean scores were greater for students receiving CAI on two variables, comprehension and total reading, when compared to non-CAI students. On the vocabulary variable students receiving traditional instruction only attained greater mean scores than students receiving CAI.

Kleinmann (1987) conducted a study to determine whether CAI in reading has a differential effect on the

reading achievement of non-native speakers of English enrolled in a basic skills college reading course. The subjects in this study consisted of a heterogeneous group of seventy-six-non-native English-speaking students, who were enrolled in the College Reading 1 course during the Fall 1985 semester at Queens College, City University of New York. The seventy-six subjects in the study represented six classes: three treatment groups receiving CAI in reading, and three control groups receiving no CAI. Results of the study indicated that both groups made significant gains in reading achievement. Except for one teacher, the experimental group scored higher gains on the posttest than did the control groups. Reading achievement gains did not differ significantly when the control groups were compared with the CAI treatment groups. The results revealed that while within control and treatment groups significant gains in reading achievement were made, no significant differences between control and treatment groups were found in the gains they achieved.

Mcintosh (1993) investigated the effects of computer-assisted and teacher instruction on reading achievement scores of Urban, low achieving African-American learners. The initial sample consisted of 494 African-American students divided into three groups. Non-computerized

Classroom Technique (NCCL), computer-assisted only (CAI only) and computer-assisted instruction plus teacher management strategies (CAI+TMS). Data from 375 students only were used in the analysis. A factorial repeated measures MANOVA revealed that both the CAI only and the CAI+TMS produced significant ($p<.05$) achievement score gains. The NCCT group gained in some cases but not in others. In one case, the CAI+TMS group had significantly higher ($p<.05$) gains than the CAI only group. In others, CAI+TMS group significantly ($p<.05$) out gained the NCCT group.

Park (1991) conducted a study to compare computer-assisted instruction (CAI) and self-paced individualized instruction (non-CAI) on reading achievement and change in attitudes towards the computer of adults enrolled in an adult basic education (ABE) programme. The subjects were 32 ABE students enrolled in Northwest Vocational Technical School Adult Education Center. 32 students divided into experimental and control group, a pretest to determine if there was a significant pre-existing differences between the two groups was conducted. The findings of this study indicated 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 differences existed between the two groups.

The attitudes of CAI students toward this method of instruction become more positive although it was not statistically significant.

Harris (1994) compared two different methods of instruction to find which was more effective in improving reading achievement for college students. One of the methods was a combination of computer-assisted instruction (CAI), with microcomputers and software, and printed reading materials, which is individualized and self-paced. The other method was individualized instruction, which was traditional, self-paced instruction (non-CAI) with printed reading materials. 120 students enrolled in developmental reading course at Northeastern State University, Tahlequah Oklahoma divided into experimental and control groups. Experimental group used computer assisted instruction and self-paced instruction with printed reading materials. Control group used self-paced individualized instruction with traditional printed reading materials. Results of the study showed no significant difference favoring computer-assisted instruction (CAI) over self-paced, individualized instruction (non-CAI) for reading achievement. The results showed that development reading courses have a positive effect on reading achievement for college students.

Al-Eisa (1994) investigated the effectiveness of learner control over content, learner control over display of instruction and learner control over both content and display of instruction, for high-ability and low-ability students in their achievement of reading comprehension from lesson delivered by computer-assisted instruction. 152 undergraduate students from the college of technology in Riyadh, Saudi Arabia were participated in this study. The experimental design of this study was a post-test only design. The finding of this study did not support the hypothesis indicated that high-ability students who were given learner control over content, over display of instruction or over both, would gain higher mean scores than high-ability students who did not receive any control. High-ability students who received control over both content and display of instruction gained a significantly higher mean score than low-ability.

Fletcher et al. (1972) summarized some of the more important findings obtained from the evaluation of the Stanford CAI programme in initial reading. Reading achievement of pupils who received computer-assisted instruction in initial reading was compared with reading achievement of pupils who did not receive computer-assisted instruction. Twenty-two pairs of first-grade

boys and 22 pairs of first-grade girls were matched on the basis of Metropolitan Readiness Test Scores. Results of the study indicated that the computer instruction resulted in significant posttest gains: further, the improvements were not limited to the phonics-oriented goals of the computer curriculum. The data suggested that computer instruction benefits both girls and boys, but that it is relatively more effective for boys.

Hendon (1976) conducted a study to compare the student reading and vocabulary achievement by classes using a standard basal-reading series with classes using the same standard basal-reading series and computer-managed teacher support system in reading. The reading and vocabulary achievement growth of a sample of 40 classes of elementary students was measured by using a standard basal-reading series teaching method during the 1972-1973 school year and provided the control group data for this study. The same teachers' classes achievement growth was measured during a similar time period one year later by using the same standard basal-reading series in conjunction with a computer-managed, teacher support system in reading; this measure provided the experimental data for the study. Hypotheses comparing the achievement obtained while utilizing the two methods were stated in the null form and utilized a Fisher's t test of significance at the .05 level for rejection. The finding

of the study were. (1) There was a different at the .05 level of significance between classes' reading scores obtained by classes of students measured by the IOWA Test of Basic Skills to indicate that greater reading growth was obtained by classes of students using standard basal-reading series than was obtained by students in the same teachers' classes the following year using a computer-managed teacher support system in reading with the same standard basal- reading series. (2) The null hypothesis regarding vocabulary- achievement growth during the two year study while using both methods was not rejected.

Levy (1984) conducted a study to determine which of three methods of teaching reading was most effective; by comparing the reading achievement of 300 pupils randomly selected from six elementary schools in the Port Arthur Independent School Distrect who were exposed to computer assisted reading instruction, prescriptive reading instruction and traditional reading instruction. The research design used in this study was a pretest/posttest, control group design. The .05 level of confidence was set as the criterion for rejecting or not rejecting the null hypotheses. Based on the findings of the study it was concluded that: (1) the traditional reading method was more efficient than the prescriptive method and the computer-assisted method for increasing

both the total reading and reading vocabulary scores of fourth and fifth grade pupils, (2) the traditional reading method was more efficient than the prescriptive method for increasing the reading comprehension scores for fourth and fifth grade pupils, (3) there was no difference in the efficiency of the traditional reading method and the computer assisted method for increasing the reading comprehension scores of fourth and fifth grade pupils, (4) there was no difference in the efficiency of the prescriptive reading method and the computer-assisted method in the increasing either the total reading, vocabulary or comprehension scores of fourth and fifth grade pupils.

Sedlacek (1985) conducted a study to determine whether significant differences existed in the achievement and attitudes of three groups of fifth grade remedial reading students after being taught using computer-assisted instruction and conventional management programs. Three groups of fifth grade remedial students were formed. For each group, special reading instruction was provided for 12 weeks. The groups were: (1) the computer group- group A; (2) the Hoffman Reading Achievement programme group- group B; and (3) the Science Research Associates Reading Laboratory group- group C. Results of the study were : (1) The differences between the pre-and post-test scores of reading vocabulary, comprehension, and attitudes over

all three groups was statistically significant; (2) the difference across pre- and post-test scores of reading vocabulary, comprehension, and attitudes among all three groups was not statistically significant; (3) the interaction in pre- and post-test scores of reading vocabulary, comprehension, and attitudes between the groups was not statistically significant; and (4) the correlation between the gain scores of the California Reading Achievement Test in vocabulary and comprehension and the Estes Reading Attitudes Scale gain scores for each of the three groups was not statistically significant.

Hoffman (1985) conducted a study to determine if there was a difference in reading achievement and attitude toward reading of elementary students receiving supplementary CAI and students receiving supplementary traditional instruction. Also determined was whether or not there was a difference in reading achievement and attitude toward reading of boys and girls. Ninety six students from four fifth-grade classes in two K.5 elementary schools in a large Midwestern School System. Control and experimental groups were identified in each school. Conclusions based on the findings of the study were: (1) Differences in gender contributed significantly to students attitude toward reading. (2) CAI was more

effective for males than for females. (3) Students supplemented by CAI in vocabulary and comprehension performed as well as students supplemented by traditional instruction in vocabulary and comprehension. (4) Males supplemented by CAI in vocabulary and comprehension performed significantly better than males supplemented by traditional instruction in vocabulary and comprehension. (5) Traditional supplementary instruction in vocabulary and comprehension was significantly more effective for females than for males.

Bryg (1985) conducted a study to determine the effect of computer-assisted instruction upon reading achievement with selected fourth-grade students. One hundred thirty two fourth-grade students divided into two groups, one experimental given traditional reading instruction along with computer-assisted instruction, and one control group receiving only the traditional reading instruction. Findings of the study indicated that no significant difference existed between the means of the experimental and the control groups on reading comprehension. However students in the experimental group showed a significant gain between the administration of the pretest and posttest.

Schneider (1986) conducted a study to determine the unique contribution of I.Q, gender, instructional

organization, time on the computer, classroom instructional time, ethnicity and total instructional time to the predictability of achievement gain in a computer-assisted instructional setting in reading. The sample consisted of 2,000 students in grades three and five from a large suburban school district in the Dallas-Fort Worth area. The study gave the following conclusions: (1) students with high or low I.Qs should be given preference in CAI setting in reading in third grade. In fifth grade, low I.Q students should be given preference while other instructional strategies should be considered for high I.Q students. (2) In CAI setting an increase in total time in reading instruction is not most appropriate method for raising achievement in third or fifth grade. (3) Achievement gains of American Indians and Blacks may be increased if they are given more time in CAI in reading. (4) Boys and girls benefit equally from CAI in third grade. In fifth grade, girls benefit more than boys. (5) High computer time and high classroom time and low computer time and low classroom time result in the greatest gain for students in grade five.

Schmidt (1986) conducted a quasi-experimental study to investigate the effects of computer assisted instruction (CAI) and three software packages upon the achievement and attitude of students in grades seven, eight and nine in a small rural school district in eastern Pennsylvania.

The sample consisted of 122 junior high school students in a secondary school with grade seven to twelve. The students were randomly grouped into three experimental groups using computer assisted instruction and a control group receiving traditional instruction. Results of the study indicated that statistically, using the gain scores for all students in the area of vocabulary, comprehension, total scores and attitude, no significance was found between treatment groups, grades or sex. The only significance achieved was for the comprehension variable which yielded significant for two-way interaction between group and grade at the .05 level. This significance led the researcher to believe that certain treatments achieved better results at certain grades than other treatments did.

Adams (1987) investigated the differences between students taught reading by departmental and computer assisted instruction in an experimental group and students taught reading by departmental instruction only in a comparison group on the variables of reading achievement, self concept, and attendance. The study also investigated the differences according to grade level and sex. Subjects for this study included 92 low socioeconomic minority seventh and eighth-grade students. Results of the study indicated that experimental group

students achieved at the same level on total reading, reading comprehension, reading vocabulary, reading achievement according to grade level and sex, and had the same perceptions of themselves according to grade and sex, and attended school at the same rate as comparison group students according to grade level and sex.

Davidson et al. (1991) evaluated a computer system developed to assist in the teaching of reading to beginners, the system uses digitized speech and the content is based upon a reading scheme already in use in the schools in a pilot study. Twenty children, ten in the intervention group and ten in the control group, in two schools were involved over a four week period. Results of the study indicated that the experimental group improved their scores significantly more than the control group only on the standardized reading test. The results suggested that the system can be helpful and that its effect goes beyond the words being practiced.

Schmelz (1994) conducted a quasi-experimental study to investigate the implementation and results of using an integrated learning system as the primary instructional methodology in tenth grade remedial English courses. 76 tenth grade students participated in the study. The subjects of the study were assigned to either traditional classrooms without access to computers or to a computer

laboratory where instruction was presented using an integrated learning system and occasional teacher-directed lessons. The study took place over one academic year (36 weeks). The findings of the study indicated that the mean scaled score gains for both groups showed improvement in reading comprehension and English. Findings from the analysis of covariance of gain scores with the pretest as the covariate 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. Absenteeism and discipline referrals were higher for the control, but only the discipline referrals were significant. By the end of the study there was a marked decline in the percent of the treatment group who liked English and who preferred taking English in a computer laboratory.

Woehler (1995) conducted a study to examined reading gains on an achievement test and to examine attitudes toward reading and computers for at risk students in a computer-assisted laboratory compared to a similar group of students not in the laboratory setting. 337 students in grades six, seven, and eight, in a central Texas Junior High School participated in the study. The treatment group consisted of 127 students and the control

group consisted of 210 students. The results of the study indicated that the laboratory experience caused significantly higher gains in reading achievement for the treatment versus the control group. The analysis of the attitude survey showed no significant differences in 20 of the 27 questions. The students in the laboratory group were more positive in their attitudes toward the statements than students in the control group.

Varner-Quick (1994) conducted a study to determine the extent to which computer-assisted writing and language arts instruction affected academic achievement and attitudes toward reading of selected students. The study included sixty students in grade four. 30 students in the control group were instructed using the traditional methods(i.e the basal reader approach). The 30 students in the treatment group were instructed using computer-assisted instruction. The data indicated that there was a definite advantage in reading performance for students that use CAI over students that use only traditional teaching method. These results indicate that CAI teaching methods provide urban children with a more enriched learning experience.

Aweiss (1994) investigated the effect of using computer mediated reading supports on the reading comprehension and the reading behavior of foreign

language learners. The overall design of the study was hybrid in nature, involving a quantitative analysis of the reading performance of beginning American learners of Arabic as a foreign language (AFL), and a qualitative analysis of their perception of the different features of the experimental task. The findings of the study indicated that the computer-mediated reading supports chosen for the study did facilitate reading comprehension during the independent reading of informative expository and narrative texts. The findings, further suggest that vocabulary knowledge was the primary contributor to reading comprehension. The results of the quantitative analysis can be interpreted in light of metacognitive theory and the technical attributes of the computer. Beginning readers who generally not skilled at monitoring their comprehension and in the selection and use of study strategies, benefited from situating them in an expert's environment that enhanced their interaction with the text. The results of the attitudinal survey revealed that readers had positive attitude toward the reading task and toward their computer-assisted reading experience.

2.2.2 COMPUTER-ASSISTED INSTRUCTION EFFECTS ON READING COMPREHENSION

Reinking (1984) investigated the use of the computer to affect reading comprehension among intermediate grade-

readers. The computer was used to provide textual manipulations not readily available in printed text and which were aimed at increasing comprehension. One hundred four intermediate-grade readers were blocked on the bases of reading ability and randomly assigned to one of the four treatment groups. (1) Computer group with the following options, definition of selected words , a simplified version of the passage, more background information and the mean idea of each paragraph. (2) Printed passage group with the same options. (3) Computer group with no options for textual manipulation; and (4) Computer group with all textual manipulations being viewed after reading the text. The study concluded that the comprehension of intermediate grade readers may increase when the computer is used to control the present of textual manipulations.

Bassett (1986) investigated the efficacy of the computer in teaching reading, as well as the effects of chunking text, or breaking it into meaningful units, on the subject's comprehension of the text. Thirty remedial reading students (fourth through sixth grade level) from a community college in Memphis, Tennessee, participated in four model/format combinations: on paper in unchunked and chunked format, on the computer in unchunked and chunked format. Results indicated that the comprehension and reading rate of the material read on the computer did

not significantly differ from the comprehension and reading rate of material read on paper. Also reading chunked material did not significantly improve comprehension or rate. The study revealed that neither reading material on the computer nor chunking the material into meaningful units enhances nor impairs comprehension or reading rate. However, data did indicate very positive attitudes toward the use of the computer in education and some attitudinal change was observed at the conclusion of the study.

Reinking et al. (1985) conducted a study to explore the feasibility of using computer-mediated text to monitor the reading and study behavior of intermediate-grade readers reading and studying expository text. The subjects, 104 fifth and sixth-grade students (good and poor readers) were blocked on the basis of reading ability and then assigned randomly to the four experimental conditions. Two hypotheses were tested (1) Using the computer to provide contingencies would facilitate reading comprehension. (2) Providing options for intermediate grade readers to interact overtly with the text would encourage more active processing of the text. Results of the study indicated that computer-mediated text can influence reading comprehension and that comprehension was most consistently increased when

manipulations of the text were under computer control. In response to the hypotheses results indicate that the comprehension of a particular set of expository texts can be affected by variations in textual manipulations mediated by a computer.

Roth et al. (1987) conducted a study with the purpose to assess the effectiveness of two microcomputer programs for improving word recognition/ decoding skills, and the extent to which decoding improvements lead to improvements in reading comprehension. The programs were used for 8 months, the subjects were the 108 children from all fourth-grade classes in two schools in a large city. Children in both schools were from low socioeconomic (SES) background. Results of the study indicated that use of the programs led (a) to substantial increases in word recognition/decoding skills, and (b) to substantial improvements in comprehension at the word and proposition/sentence level, but to no improvement at the passage level.

Riley (1990) conducted a study with two purposes one was to determine if combination computer assisted instruction/ traditional instruction could be effective in improving reading comprehension performance for a sample of fourth and fifth grade subjects, and the second purpose was to determine which students could best be

helped by the use of computers. The student groups compared were males versus females and gifted versus non-gifted. One hundred fifteen fourth and fifth grade subjects were randomly assigned to either the combination CAI/ traditional instruction group or the control group. The results of the study revealed that in all variables, males versus females, gifted versus non-gifted, and CAI versus non-CAI, there was no significant differences after twelve weeks of treatment. The survey/ opinionnaire revealed that 85 percent of CAI subjects enjoyed their time on the computer, and 79 percent would use the computer again if they had the opportunity.

Sclafani (1994) compared two methods of reading instruction, one based on CAI and the other based on conventional textbook instruction. The design used in this study was a pretest, posttest, treatment and control group design. The treatment group received CAI with a computer software package. Students in the control group (textbook approach) received instruction with a college level reading skills book. From the findings of this study, it appears that achievement was similar whether instruction was CAI or textbook. This may be because the instruction was individualized for both groups. Perhaps individualizing instruction is more important than the nature of the delivery of materials. When the same teacher taught the same materials in the same organized

way via both media, the same learning was achieved in both groups.

The findings of the above studies indicate that majority of the studies reviewed indicate that Computer-Assisted Instruction had an effect on students reading achievement. They further reveal that Computer- Assisted had an effect on reading comprehension of the students in some of the studies and in other studies it had no effect.

2.3 COMPUTER-ASSISTED INSTRUCTION AND VOCABULARY

Many studies have been conducted to study the effect of Computer- Assisted Instruction on vocabulary learning of the students at college and school level. These studies have been presented below.

Avent (1994) conducted a study with two purposes (1) Courseware development. This process included expertise from a variety of fields of study. The first purpose was to develop computer assisted language learning software. (2) Gather data. The second purpose of the study was to develop empirical evidence concerning the value of this courseware specifically and computer-assisted language instruction in general. Three sets of data were analyzed. They were data from the (1) grammar measure; (2) vocabulary measure, and; (3) vocabulary measures within

the computer group. Results of the study showed that the first set of data found that at every ability level the mean score of the computer group was higher than that of the language lab group. Also the indication was that there was no interaction between type of instruction and ability group. The second set of data found that in every instance the mean score of the computer group was higher than that of the language lab group. The indication was that there was interaction between type of instruction and ability group. Finally, there was a comparison of the performances by the same individuals on two different vocabulary measures. The first tested items that had been taught by computer. The second tested vocabulary items that had not been taught by computer. The mean scores were significantly higher for computer taught items than for non-computer taught items, again there was no indication of interaction between type of instruction and ability group.

Kang (1995) examined the effectiveness of computer-based, context embedded approaches to second language vocabulary learning in comparison with conventional instructions strategies. Four experimental treatments were prepared: (1) paper & pencil (P&P), (2) computer-based word for word (CW), (3) computer-based word for word plus picture (CP), and (4) computer-based context

conditions (CC). The experiment was carried out at a local elementary school in Seoul Korea. The follow-up test data revealed that the CC group tended to perform rather poorly for the first few sessions, but made a gradual improvement in the final session. The CC groups performance was superior to the other groups. In the retention test, the CC group showed significantly higher performance than any other group on all the major tasks. This study strongly suggest that the proposed context-embedded approach to second language vocabulary learning was most effective in promoting knowledge transfer, listening comprehension, and long term recall vocabulary definitions.

Kolich (1986) conducted a study to assess the effectiveness of a computer software programme in teaching a common list of unfamiliar words to eleventh grade senior high school students. One hundred and seventy-one eleventh grade students from State College Senior High School, located in center county, Pennsylvania, participated in the study. students were randomly assigned to one of four treatment groups or a control group. The experimental groups were exposed to fifteen low frequency words by means of a computer software programme entitled WORD ATTACK. An analysis of the posttest and delayed posttest scores revealed that the experimental groups achieved significantly higher

vocabulary scores than the control group. Further analysis revealed that the sentence completion group performed significantly better on the vocabulary posttest than students trained by a definitional approach. Although no significant differences in attitude toward a method of training were demonstrated by any of the treatment groups on the posttest, some differences were demonstrated on the delayed posttest.

Cowan (1988) conducted a study to examine whether there were significant differences in vocabulary development and vocabulary retention between three groups of fourth-grade students. (a) those participating in computer-assisted reinforcement of vocabulary in addition to the regular Open Court Vocabulary Programme. (b) Those participating in paper-and-pencil reinforcement of vocabulary in addition to the regular Open Court Vocabulary Programme, and (c) those participating only in the regular Open Court Vocabulary Programme as prescribed by the open Court Headway Reading Programme. A total of 133 students in six classrooms in Alabama participated in the study. Results of the study indicated there were no significant differences among the three treatment groups either on posttest or retention test scores.

Wright et al. (1987) investigated whether computer-assisted instruction is as effective and efficient as

teacher-only instruction in teaching a child with severe learning difficulties a basic sight vocabulary. The null hypothesis is that there is no difference between teacher-only and computer-assisted instruction but, given the optimism surrounding the use of computers with children with severe learning difficulties. the author predicted that the computer-assisted conditions will produce better learning. Subjects were 18 children from a special school for children with severe learning difficulties, age-range 4 to 18 years (mean age 10 y 7 m). Their mean British Picture Vocabulary Scale age was 2 y 7 m (range < 1 y 8 m to 5 y 10 m). The results demonstrated that all 12 children in the experiment groups significantly improved their sight vocabulary. Trends in the data indicated that the teacher-only condition produced better learning than the computer-assisted condition, and that this was particularly true for the children with lower ability.

Palmberg (1988) investigated the effects of children's interaction with computers on their learning of foreign vocabulary. Two Swedish-speaking boys in Finland, aged 9 and 11, participated in the experiment. In order to conform as much as possible to the learners' young age and general interests; a computer adventure game, Pirate Cove was selected for the experiment. The findings of

this study indicated that computer games, and especially motivating text-adventure games in a foreign language, constitute a good example of the material that satisfies the criterion of language needs relevant to young learners of that language, and, at the same time, promotes vocabulary learning.

Horton et al. (1988) conducted two studies to test the effectiveness of a computer-based vocabulary programme. In experiment one, high school students classified as learning disabled and remedial were given a 60-item pre-test made up of terms normally taught by their teacher. After selecting the 35 most difficult terms , 28 of them were assigned to a computer programme involving a pre-test, practice, post-test sequence, and using cumulative review, mouse-controlled responding, and configuring responses to focus students attention. Results of this experiment indicated a significant gain on computer items after the second computer session for the youngster with learning disabilities, and after the first session for remedial pupils. Performance on control items did not improve across measures for either group.

In Experiment two, two classes of general education students aged 14 to 15 years in a nineth grade health class participated in this experiment. One class contained 20 students and the other contained 16

students. Students of various ability levels were in those classes; above average, average, and below average. The teacher selected 50 vocabulary terms from three chapters of a health text entitled Health: A Wellness Approach. In experiment two, a pre-test/post-test control group design was arranged to investigate the effects of the same computer programme used to teach health terms to general education high school students. The results were similar to those of the first experiment.

James (1989) investigated the effect of computer-assisted instruction for enhancing reading vocabulary performance of first and second grade students in an urban public school. The study population was divided into two groups: an experimental group with 14 subjects (Group 1) and the control group with 19 subjects (Group II), for a total population of 33. Group 1 received reading vocabulary instruction on the microcomputer using EDU_WARE's software programme, Spelling Bee with Reading Primer, a word recognition practice and drill programme. Group II received no microcomputer instructional time and served as the control group. This study demonstrated that computer-assisted instruction is accepted to primary grade students, is an effective tool for individualized drill and practice, and has the potential to be a useful adjunct to classroom reading instruction.

Kay (1994) conducted a study with the purpose to assess differences in gains in receptive vocabulary acquisition by preschool students with language disorders using computer technology compared to gains made by similar students exposed to the same teaching methods without the addition of technology. Results of t-test indicated a significant difference in gain scores of both groups. However, the difference between the groups' gain scores was not found to be significant. Teachers' logs, which provided qualitative data, suggested that although gains were made by both groups, the older children seemed to prefer computer activities, while younger children appeared to prefer manipulatives- possibly because of shorter attention spans.

The findings of the above mentioned studies revealed that the Computer- Assisted Instruction had an effect on students' Vocabulary learning. Therefore we can say that computer-Assisted Instruction is an effective tool for teaching vocabulary.

2.4 COMPUTER-ASSISTED INSTRUCTION AND GRAMMAR

The different studies conducted to study the effect of Computer- Assisted instruction on Grammar learning have been presented below.

Williams (1980) conducted a study to determine if students enrolled in French 102 at the University of Georgia could learn five points of French grammar as effectively through computer-assisted instruction using materials created by the researcher, as they could in conventionally-taught classes. Each of the five lessons was devoted to one of the following grammar points, chosen by a panel of expert as the most difficult to learn. Reflexive verbs; Imperfect tense, Indirect object pronouns; y and en; and conditional tense. An analysis of covariance showed no significant difference between the control and experimental groups on the post-test for reflexive verbs, the imperfect tense, y and en, and the conditional tense, the analysis of covariance did show a significant difference between the control and experimental groups as measured by the posttest for indirect object pronouns. The experimental groups achieved a higher performance score. It was determined from the analysis of data that students using CAI materials learned as well as or better than students taught in conventional classes. A students questionnaire also showed that students approved overwhelmingly of CAI as a teaching medium.

Antista (1975) investigated the results of using computer-assisted instruction to teach basic English grammar material in a senior high school English class.

The effects of the computer-assisted instruction on students achievement and attitudes were investigated. The experiment took place during the 1970-1971 school year. Four-pre-existing classes were used as the experimental and control groups. Characteristics of the subjects would have them labeled as educationally average as defined by most authorities. The experimental groups (one male and one female group) consisting of 51 students used computer-assisted instruction as part of their method of instruction. While the control groups (one male and one female group) consisting of 63 students did not use computer assisted instruction. Both the experimental and the control groups had the same three teachers. The design of the experiment involved giving pretest before the units were presented and before the experimental classes began to use the computer and posttest after instruction on five units was completed. Nine null hypotheses were investigated. The null hypothesis was to be rejected if there was a different significant at .05 level of confidence. Hypothesis 1 dealt with achievement in language arts, hypotheses 2-4 dealt with study habits, study attitudes, and study orientation. Hypotheses 5 and 6 dealt with attitude toward education and toward English class. Hypotheses 7 and 8 dealt with school related self-concept and motivation; and Hypothesis 9 dealt with achievement in the experimental group broken down into

two groups based on the number of times the students used the computer. The results of the analysis of data led to an acceptance of all nine hypotheses. In hypotheses 1-8 there was no significant difference between the experimental and the control groups. In hypothesis 9 there was no significant difference in achievement between members of the experimental groups who used the computer 10 times or less and those who used the computer 11 times or more.

Fischer (1986) summarized the report of the field test of Bridging the Gap. Bridging the Gap is a series of computer lessons designed to assist students in grades 4-6 in their learning of basic language skills. A total of 56 students in English as a second language/dialect (ESL/D) classes from three Kitchener-Waterloo elementary schools participated in the field test. The students ranged in age from 11 to 15 years (mean=13,1 years) and had been in Canada for between 3 and 52 months (mean=25.3 months). All students were tested before and after the series of computer sessions on the grammar concepts dealt with in Bridging the Gap in order to find out whether students improved their knowledge of those grammar concepts through the use of the lessonware. Results of the study indicated that no significant overall difference was found between the improvement of test

scores of students who had used Bridging the Gap and the scores of students who had used the computer games. Females in the experimental group, however, did show significant improvement on the SC subprogram. Students perceptions of Bridging the Gap, use of the computer and learning English in general were predominantly positive. Their self-reports of feeling were also quite positive.

Elkins (1986) examined the effects of computer assisted on English grammar and mechanics achievement of third grade students. Specifically, it investigated whether or not there was a significant difference when one group received traditional instruction with practice provided by means of workbooks and worksheets, while another group received traditional instruction with practice provided by utilizing a computer. The subjects consisted of 74 students from chapter 1 school from a large ,midwestern school corporation in an industrial community. The groups were from four intact classrooms with 41 students in the experimental group and 33 students in the control group. Statistical analyses revealed the following results: (1) The experimental group made significantly greater gains than the control group in language mechanics and language expression achievement. (2) There was no significant difference in language mechanics and language expression achievement with regard to gender or ability levels of the

experimental group and the control group. (3) There was a significant difference in language mechanics achievement but not of language expression achievement, between the experimental group and the control group. The experimental group made greater gains in language mechanics achievement than the control group.

Mitchell (1993) investigated the relationship between cooperative and individualized computer-based learning environments, auditory and visual learning styles, and the academic achievement of adult ESL students enrolled in an intermediate grammar course. This study was conducted with 55 ESL students (male= 18; female=37). ANCOVA was used to analyze differences among the post-test scores, testing main effects and interaction crosstabulations and correlations were performed to determine other relationships between the independent variables. The results of the post-test assessment of the use of past tenses did not reveal any main effects or interaction between groups. There were no significant differences for cooperative versus individualized CAI environments, or between auditory and visual learners. A significant positive correlation was found between students' age and the amount of time required to complete the task. The number of absences and achievement were found to be significantly negatively correlated. The

conditions set up for this study proved to be favorable for supporting equally cooperative and individualized CAI environments It was suggested that because there were no differences between the two CAI learning environments that cooperative CAI learning environments might be utilized when cost is a factor.

The findings of the above mentioned studies revealed that Computer-Assisted Instruction had an effect on students' achievement in grammar. This means that Computer-Assisted instruction as an instructional tool can be used to teach grammar effectively.

2.5 ATTITUDES TOWARD COMPUTER-ASSISTED INSTRUCTION

The Attitude of students towards Computer- Assisted Instruction is reflected in the studies presented below.

Mathis et al. (1970) investigated the attitude of college students toward computer assisted instruction. Forty-seven females and 17 males were selected randomly from 108 students in the General Psychology 205 class at Florida State University. Non of the students had experienced CAI. Results indicated that students were generally positive toward CAI but those that had experienced it were more positive than those who participated in the reading control group. Students who made many errors while being instructed by the computer

were less positive toward it (r=.49). Also students who received a CAI programme or reading covering unfamiliar concepts rather than material on which they were to be tested that week were less positive. Pretesting had no effect on attitudes.

Offir (1983) conducted a study to find out the attitudes of instructors and students, and the interaction between these attitudes toward computers as instructional aids. This research was done in the Physiology Department of London University. Three different research tools were used; observation, questionnaire, and interview of students. Two different interview methods were used (a) formal interview and (b) informal interview. In the formal interview, 12 instructors were interviewed. Thirty three students were interviewed prior to their learning with the computer. Twenty of them were interviewed at the end of the academic year-ten students who studied physiology with the help of the computer and ten students who studied physiology without the computer help. Results indicated that all the instructors show a positive attitude toward using the computer in the process of teaching physiology. The analysis of the lecturers' interviews showed that the computer can be expected to be an effective assistant to the instructors, in order to achieve their aims in teaching. All of the students (193) preferred the method

of a "lecture" more than any other methods of learning. A disagreement was found between the instructors' and students' opinions. The students showed a definite preference for learning by lectures. The instructors preferred methods which give the students a chance to learn individually; they did not see the lecture method as most efficient in achieving their aims in teaching.

Skinner (1988) conducted a study to determine the attitudes of college students toward working with CAI in the context of a personalized system of instruction (PSI) course. Thirty-six undergraduate students enrolled in a course in behavior management in education served as subjects for this investigation.. All students were physical education majors. the sample included 12 sophomores, 19 Juniors and 5 Seniors.. Sixteen females and 20 males participated in the study. All participants in the study were enrolled at the main campus of Ohio State University (OSU), Columbus, Ohio. Results of this study lend strong support to previous research efforts which have determined that college students over whelmingly demonstrate positive perceptions and attitudes toward CAI.

Stevens (1991) conducted a study to sought answers to the following questions. (1) Did the students like using the computer SRC? (2) How easy was it for the students to

use the computers? (3) How much English did the students think they learned by using the computers in the SRC? (4) How did the students' attitudes toward CALL change during their first year at Sultan Qaboos University-Sultanate of Oman. To elicit answers to these questions, a survey instrument was constructed and validated. The questionnaire was administered during class time to 24% (N=75) of the 318 first year Foundation Science Course (FSC) students, about a third of whome were famale. The data suggested positive attitudes for all of the research questions, and it was found that the students in this survey enjoyed using computers to study English and that they experienced little difficulty or confusion in doing so. In addition, they felt that they were improving their English by using the computers, and that their ability to use computers improved their time. They thought that using computers was important to them, and their attitudes become increasingly positive the more they use the computer.

Saracho (1982) investigated the effects of a computer-assisted instruction (CAI) programme on basic skills achievement and attitudes toward instruction of Spanish-speaking migrant children. Subjects of the study were 256 third, fourth, fifth, and sixth grade. The study used two comparable groups of 128 children each. One group used

CAI to supplement instruction while the second group served as a control group. The results of the study indicated that students who used the CAI programme had greater achievement gains than did students who participated in the regular classroom programme. However, students who were in the non-CAI programme had more favourable attitudes toward CAI than did students in the CAI programme.

Griswold (1984) to determine the relationship between students attitudes and participation in CAI, through the strength of a longitudinal design, Griswold conducted this study. Data from 2 successive years of elementary school were used. Keeping in mind that ethnicity, gender, and achievement level are correlated with students attitudes, the following hypothesis was formulated: students attitudes of fourth and fifth graders, independent of the effects of ethnicity, gender, and achievement, are unrelated to long-term participation in drill and practice CAI. For 2 years various attitudes of more than 155 fourth and fifth grades who did or did not participate in computer-assisted instruction (CAI) were evaluated. Multiple regression analysis indicated that CAI (independent of gender, minority status, and achievement) accounted for significant amounts of variation in self-responsibility for success and academic

self-confidence, but not for attitudes toward school or math.

Kahn (1985) in a qualitative study of the attitudes of the 23 individuals in one fifth grade class toward various aspects of microcomputer use, Kahn designed his study to explore and describe the context and some of the complexities of these attitudes.In this study information was gathered primarily through interviews with the students, their teacher, and their principal. Students were nearly unanimous on many attitudes. All were strongly positive toward microcomputer use generally. They enjoy current in school microcomputer use and would like to try additional types of uses and equipment. They believe microcomputer will improve education, that all students should learn about them, and that adults would benefit too. They believe that all students are equally interested in computers whether boys or girls, and whether good average, or poor average students. they also believe that boys and girls are equally good at microcomputer work. Almost all expect to use computers in their adult home and work life. They understand that computers are effecting their lives in many ways but they are clear that humans control computers.

Erickson (1988) designed a study to probe the nature of sex differences in students attitudes towards

computers. The subjects were 1531 students, mostly in grades five through nine, attending school in California and being exposed to computers in a wide variety of settings. Questionnaires provide the bulk of the data, though they were enhanced by classroom observation and students writing. There were three principal results. First, while the sexes differed very little in the mean on most of the measures attitudinal variables, individual classrooms differed greatly from one another, suggesting a strong environmental effect. Second, even though the sexes were similar in their mean attitudes they differed in the variables predicting those attitudes; for example self-concept predicted a measure of task value most strongly in males, while for females the environmental effect was not important. Third, the patterns of prediction uncovered in this work are consistent with Eccleses Motivational Theory, lending evidence to assertions both that it applies to the computer domain and that it is a useful tool for a researchers and developers.

Johnston (1987) as part of a study evaluating the effectiveness of microcomputer programs for language development, classroom research was carried out in two secondary schools during early 1985. Four language development programs were used over an eight-week period by pupils in a mixed ability, third year class, and

pupils attitudes towards these programs and towards microcomputers in general were sought by questionnaire and through discussion. in the secondary school, pupils in six classes in which the use of microcomputers was already well established, from year one to year five, were asked to complete the attitude questionnaire, and their opinions were also sought by interview. In all, five of the seven classes were of mixed ability, the remaining two begin O-level/CES group and a CES set. A total of 144 pupils completed the questionnaire. pupils attitudes towards the introduction of computers into English lessons, indicated a general preference for computer assisted learning. Pupils evaluated the software used in their lessons primarily on its ability to offer them cognitive challenge. Pupils' perceptions of their learning and of potential applications of computers is limited by their expectations of English lessons especially of the need for basic literacy skills. Few sex-related differences are evident, though girls express slightly less positive attitudes.

Swadener et al. (1987) examined the similarities and differences in computer-related attitudes between sixth grade boys and girls of different mathematics achievement levels. Subjects for the study were 32 randomly selected sixth grade students. They were selected from two schools

in a moderate sized middle class suburban/rural school district. The instrument used in the study was adapted primarily from the computer literacy and Awareness Assessment Instrument distributed through the Minnesota Educational Computing Corporation (MECC). The adapted version, consisting of 17 likert-type items with a five-part scale format ranging from "Strongly Disagree" to "Strongly Agree" was developed for local use during the project. the initial draft of the instrument consisted of 30 items keyed to four computer attitude categories: self-confidence in the use of computers, perceived utility of computers, general attitude toward computers, and sex role in computers. The students were divided into two groups: sex of students and high and low mathematics achievement. Testing of students attitude toward computers was done at the end of the school year. Effects were analyzed using ANOVA procedures for each scale in order to more clearly identify effects sources. Items pertaining to sex bias toward computers were also analyzed separately using univariate ANOVA procedures. The finding of this study tentatively confirm the similarities in the attitudes and perceptions of sixth graders toward computers. But that self-confidence may be an important factor computer participation for both sexes.

Nelson (1988) investigated the attitudes of Western Australian students toward microcomputers. A sample of 201 primary and secondary school students in the Perth Metropolitan area in 1986 were participated in this study. The students were presented with the 20-item semantic differential. A seven-point scale was placed between each adjective pair, and students were invited to tick the spot on the scale which reflected their feelings about microcomputers. Favourable attitudes were found, with no noticeable gender differences. Attitudes of younger students were slightly more positive than those of older students. The attitudes of students having a computer at home were more positive than those of students without a home computer. The results of this study generally support those found in Harvey and Wilson (1985) and Williams, F et al where the same questions were asked.

The findings of the above studies indicate that the students have a positive attitude towards the Computer-Assisted Instruction as a tool of instruction.

2.6 TEACHING ENGLISH AS A SECOND/ FOREIGN LANGUAGE THROUGH COMPUTER-ASSISTED INSTRUCTION

The researches on teaching English as a second or foreign language through Computer-Assisted Instruction have been presented below.

Chapelle et al. (1986) investigated the effectiveness of computer-assisted language learning (CALL) in the acquisition of English as a second language by Arabic and Spanish-speaking students in an intensive programme. The study also examined two student variables-time spent using and attitude toward the CALL lessons-as well as four cognitive/ affective characteristics- field independent, ambiguity tolerance, motivational intensity, and English-class anxiety. English Proficiency was measured by the TOEFL and an oral test of communicative competence. The students enrolled in the Intensive English Institute at the University of Illinois during the fall 1982 semester were invited to participate in the research. Of the 84 students in the Institute, 28 Spanish-speaking and 20 Arabic-speaking students agreed to participate. Results indicated that the use of CALL lessons predicted no variance on the criterion measures beyond what could be predicted by the cognitive/effective variables. In addition, it was found that time spent using and attitude toward CALL were significantly related to field independent and motivational intensity. These results indicate that (a) Certain types of learners may be better suited to some CALL materials than other students and (b) it is necessary to consider many learner variables when researching the effectiveness of CALL.

Hussin (1994) conducted a study with two fold purpose (a) to examine the kinds of strategies that ESL learners used when dealing with CALL exercises, the types of CALL exercises and the subject areas that are perceived to be helpful to learners, and (2) to determine what differences, if any, existed in the use of strategies between low and high proficiency learners, and their perceptions of the relative helpfulness of the types of exercises and subject areas presented in CALL programs. The sample population consisted of undergraduate students enrolled in ESL classroom at Universiti Kebangsaan Malaysia (UKM). Two sets of questionnaire were administered for data collection in addition to the researcher's direct observation of learners' behaviors in the computer lab. Statistical analyses, which include descriptive, multivariate, and t-test procedures, were employed for data analysis. The results of the study indicated that some learners preferred certain strategies over others, specifically, most learners preferred to study information from the computer and to use on-line help from the computer, and they did not favor skipping and/or quitting while doing CALL exercises. High proficiency learners used computer-rehearsing strategies more often than low proficiency learners. The study also found that learners perceived CALL to be very helpful when the types of exercises and subject areas matched,

learning occurs most effectively. This is not only true of traditional methods but also of CALL instruction.

King (1985) studied the effect of computer assisted instruction on the English language acquisition of students in grades kindergarten through eight grade whose primary language is something other than English. The project was designed to incorporate available software that is compatible with the learning theory behind the natural approach to learning English as a second language while providing these students with the benefits available in new technology. Target and control students, identified through California State Mandate Screening Instruments as limited English proficient (LEP) were selected on a matching basis. Target students were given regularly scheduled treatment with computer programs specifically identified as meeting the criteria, established in the literature, for optimizing the learning of English as a second language. Through pre-post matched test data using the CTBS or the BOEHM, where appropriate Target groups students showed two major patterns of growth. In the areas tested, target students showed gains of near significance in reading comprehension and written expression as measured by normal tests. There was no significant growth shown by the target students over control students in mathematics or attitude. There were significant gains by target

students in computer literacy. The analysis of covariants gave no further identifications of gains.

Menke (1989) conducted a study to gather information regarding the use of computer-assisted instruction (CAI) within post-secondary English as a second language (ESL) programs in the United States. A survey questionnaire designed to elicite basic descriptive and attitudinal information about the use of CAI was sent to 455 ESL programs directors, of which a total of 298 questionnaires (71.6%) were returned. Analysis of the data focused on these questions (1) what demographic factors correlate with the existence of CAI? (2) what computer equipment is being used for what purposes? and (3) what are the attitudes of ESL programme directors towards the use and implementation of CAI?. The survey results suggest that 52.5% of post-secondary ESL programs offer CAI. Of those not offering CAI, the major deterrent preventing the use of CAI was found to be concern about the lack of funds. Of those offering CAI, the major difficulty was found to be a lack of quality software. Apple (67.1%) and IBM/compatible (49.7%) micros were found to be the most commonly used computers, and writing (70.8%) and grammar (66.2%) were found to be the most common instructional purposes. For question 1, it was found that the existence of CAI correlated with the

existence of computer facilities at the institution, the use of computers for other purposes within the ESL programme, and the computer literacy of the ESL director. For question two, it was found that ESL programme that utilized Apple micros tended not to utilize IBM/compatible micros and vice-versa. Those that utilized Apple micros tended to teach language skills, where as those that utilized IBM/compatible micros tended to teach writing. For question three, it was found that ESL directors as a whole had few strongly felt attitudes towards the use and implementation of CAI seemingly due to a lack of knowledge regarding CAI.

Al-juhani (1992) to determine the effectiveness of computer-assisted instruction in teaching English as a foreign language in Saudi secondary school, Al juhani conducted this study. The study employed three research instrument: (1) A students questionnaire was distributed among a sixty experimental subjects, thirty in the experimental group and the other thirty in the control group. The questionnaire contained thirty items devised to identify attitudes toward learning English via CAI, (2) A teacher questionnaire was distributed to 60 teachers. The questionnaire was aimed toward finding out how teachers with CAI training differ from teachers with out CAI experience in their attitude toward CAI. (3) An achievement test was administered to both experimental

and control groups at the end of the programme. The test presented to the experimental group was in the form of computer software while the control group test was on paper. The two groups studied the same materials and were tested at the same time, the experimental group was taught through computer and the control group through a conventional method of teaching. The course lasted for six weeks for both the groups. The research used correlations and t-test for statistical findings of this study. They are summarized in the following. (1) The five scales, Liking, Benefit, Effectiveness, Achievement and Fear, were highly correlated with each other ranging from correlation of .79 to .81. (2) A comparison among the pre-and-posttest groups with regard to the five scales reflected a higher significance in support of the experimental group. The level of significance for all scales was <.001 with degrees of freedom (df)=29. (3) A comparison of the experimental group (post-CAI) and the control group questionnaire data and achievement test favored the experimental group. The t-value in this comparison was t.3.19. (4) Teachers with previous CAI training showed higher positive attitude toward learning English as a foreign language vai computer instruction. Teachers with CAI earned a mean of 2.97, while the mean on non-experienced teachers was 2.47. (5) The comparison between the experimental and control groups with regard

to their scores on the achievement test revealed a higher significance in favor of the experimental group with a significant t-value of 3.19.

Emerson (1994) describes the language behaviors and social strategies of English as a second language (ESL) and English as Primary language (EPL) pre-kindergarten students during cooperative Computer Assisted Instruction (CAI) experiences. Thirty three pre-kindergarten subjects ages four to five years were video taped at two personal computers during self-selected center time. The sources of data for this descriptive study were a parent computer survey, videotapes, a subject interview derived from the Young Children's Computer Inventory, and written records. Parent surveys were used to determine subjects' prior computer experiences out side school. Subjects interviews described attitudes toward computer use and the tests and developmental chicklist characterized each subjects' abilities, language behaviors were identified and arranged according to categories developed that include: turntaking, awareness of right/wrong answers, teaching/instructing, hypothesizing, and interacting with the computer. Subject interactions were tabulated according to each category and software used. EPL students used teaching/instructing language more and ESL students used turntaking language more than other

language forms. Software had an influence on subject language behaviors. The dominant social strategy used most by both subject group was cooperative behavior. Other language and social behaviors were used similarly by all subjects. The greatest difference among ESL and EPL subjects' computer use was time spent in the center. EPL subjects participated in two times more interactions in the computer center than ESL subjects.

Hsu (1994) conducted a study to examine: (1) If L2 students request modifications of the input they hear while working in a computer-based listening exercise, and (2) if there interactional computerized modifications help L2 students' listening comprehension and language acquisition. Data were collected from 15 ESL students by using a one group pretest-posttest research design. Findings from this study suggested that L2 students used the tools made available by computer technology to make input comprehensible. This study also supported SLA researchers' hypotheses that modifications promote comprehensible input and language acquisition. In particular, this study found that the text reinforcement type modifications were effective for beginning level ESL students in listening comprehension.

The findings of the above researches indicate that teaching English as a second/foreign language through

Computer-Assisted Instruction was found to be favourable and effective by the learners.

2.7 EFFECTS OF COMPUTER-ASSISTED INSTRUCTION ON STUDENTS' ACHIEVEMENT

The studies reviewed on the effect of Computer-Assisted Instruction on students' achievement have been presented below.

Vinsonhaler et al. (1972) summarized the results of ten independent studies of CAI drill and practice and have come with the following: The results indicated a substantial advantage for CAI augmentation of traditional classroom instruction, where standardized achievement tests are used as the criteria for educational performance; Generally, CAI groups show performance gains of one to eight months over groups receiving traditional instruction.

Kulik et al. (1983) used quantitative techniques, or meta-analysis, to integrate findings from 51 independent evaluations of computer-based teaching in Grades 6 through 12. the analysis showed that computer-based teaching raised students' scores on final examinations by approximately .32 standard deviations, or from the 50th to the 63th percentile. Computer-based instruction also had smaller, positive effects on scores on follow-up examinations given to students several months after the

completion of instruction. In addition, students who were taught on computers developed very positive attitudes toward the computer and positive attitudes toward the courses they were taking. Finally, the computer reduced substantially the amount of time that students needed for learning.

Dungan (1991) investigated the differences between students who were taught basic skills by traditional and CAI in one group and students who were taught basic skills by traditional instruction only in a comparison group the variables of reading language, mathematics, and listening achievement. The study also investigated the differences according to grade level and sex. Subjects for this study included 255 remedial students in grades four, five and six. All students had scored at or below the fiftieth percentile on the Stanford Achievement Test. Two groups were used for the study. The CAi group consisted of 121 students. The comparison group was made up of 134 students. Twelve hypotheses were presented and tested using multiple linear regression. Ten hypotheses were not supported by the data; two were supported. The following conclusions were made: (1) students who received traditional and CAI achieved at significantly higher level on reading than those students who received only traditional instruction. (2) students who received

traditional and CAI achieved at the same level on language, mathematics and listening as those students who received only traditional instruction. (3) students who received traditional and CAI achieved at the same level on reading, language, mathematics and listening achievement according to gender as those students who received only traditional instruction. (4) students who received traditional and CAI achieved at the same level on reading, mathematics, and listening achievement according to grade level as those students who received only traditional instruction. (5) students who received traditional and CAI achieved at a significantly different level on language achievement according to grade level than those students who received only traditional instruction.

Moore (1992) conducted a study to assess the effects of computer assisted instruction and the perceptual preferences' of eighth grade students on the mastery of language arts and mathematics. Style Inventory by Dune, Dunn and Price (1990) and the Assessment of Attitude Towards Computer Assisted Instruction, developed by the investigator, were administered to 146 eighth grade students who were receiving computer assisted instruction in a lab setting for twenty percent of their instructional time in the areas of language arts and mathematics. Three null hypotheses were advanced and

tested using analysis of variance. Hypothesis one addressed the attitudes of students toward computer assisted instruction. It was found that the majority of students, over 70%, had positive attitudes towards CAI. Students with positive attitudes had a posttest mean score significantly higher in language arts but not significantly higher in mathematics than students with neutral/negative attitudes toward CAI. Hypothesis two addressed the learning style preference of students. Comparative results indicate that students who preferred the visual modality of learning had a significantly higher posttest mean score in language arts and in mathematics than students who preferred either of the modalities. Hypothesis three addressed the gender of students. Findings from the study show that test scores for students with the same learning style preference, but of different gender, did not differ significantly in language arts or mathematics.

Findings of the above mentioned studies revealed that the effect of Computer- Assisted Instruction on students' achievement level was greater than the effect of the traditional way of instruction.

2.8 CONCLUSION

Through this chapter it is evident that Computer Assisted Language Learning/Instruction has been the focus of many researchers. Many studies were conducted to study the effect of Word processing on students' revision at the college and school levels, and also to study the effect of Word Processor on students' writing and their attitude toward writing. The methodology followed in these studies was mainly of experimental design, in which the Word Processor was compared to pen and paper or typewriter.

In the area of Reading. Several studies compared the effect of computer assisted instruction on students' reading achievement with a traditional method of teaching reading. most of the studies reviewed focused on reading achievement and comprehension, with some studies focusing on comprehension and vocabulary, or comprehension and attitude toward reading and the computer.

In the area of Vocabulary, many studies were conducted to study the effect of computer assisted instruction on students' achievement in vocabulary. The focus of these study was on vocabulary as a separate variable. In the area of Grammar, several studies were also conducted to study the effect of computer assisted instruction on students' achievement in grammar compared with the

traditional method of teaching grammar. The focus of these study was on teaching grammar through computer as a separate variable. Several studies were conducted to study the attitude of the students toward the computer assisted instruction in different fields. The methodology followed in these studies or in most of them was experimental in nature with pre-test, post-test, treatment, control group designs.

After reviewing these studies the researcher found that, vocabulary, grammar, and comprehension were dealt with separately. None of the studies reviewed had dealt with the three variables together in one study. Even though some of the studies have dealt with two variables together like comprehension and vocabulary, comprehension and attitude. Therefore, after reviewing the literature, the researcher could identify the research gap which was not dealt with in these studies It was also found that none of the studies have dealt or studied the effect of IQ, Motivation, and Attitude on students' achievement in vocabulary, grammar, and comprehension. To bridge the gap the researcher has undertaken this study which focuses on the effect of Computer-Assisted English language Teaching Programme on students' achievement in vocabulary, grammar, and comprehension. The study also focuses on the effect of

IQ, Motivation, and Attitude on the students' achievement in vocabulary, grammar and comprehension. So it can be concluded that, the research literature reviewed helped the researcher in identifying the research gap, developing the conceptual framework, formulating the objectives of the study, and in developing the methodology of the present study by focusing on the research gap identified in the area of computer assisted instruction in teaching English language.