

CHAPTER FIVE

SUMMARY AND CONCLUSION

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5.0 INTRODUCTION

The computer has created a revolution in education and the nature of learning process. One mode through which computers can be used in the teaching learning processes is the Computer Assisted Instruction (CAI) technology (Traynor, 2003). CAI is a set of voice, text, graphics, animation, video and other computer technology in one of the modern teaching methods.

According to Zhiguo (2002), CAI can play a multiplier effect in terms of emphasizing the teaching points, breaking the difficulty of teaching and improving the efficiency of classroom teaching became its clear image, strong sense of dynamic, informative, interactive and flexible advantages.

The method of instruction through CAI includes drill and practice, tutorials, games, simulations, discovery learning, problem solving and multimedia instruction. Presentation software like PowerPoint and Animation software like Flash and others can be of great help to the teachers while delivering information. Computers also help for individualization and self-pacing, immediate feedback, consistent correction procedure, immediate knowledge of correct responses, well sequenced instruction, motivation etc.

According to Kitao (1993), “CAI is good for motivating students to study English. Students are anxious to use computers. Many students are tired of traditional English classes and are interested in a new style of learning. When they use a computer, they feel that they can be master in English. They can study English with their own learning styles and see the results of their own learning. Students think materials are new and fresh if they are presented on computers, and they are often interested in even routine tasks such as learning to type. They seem to be willing to spend more hours and do more exercises on a computer.”

The role of computer in CAI is to teach subject through preferably a dialogue, to evaluate students' response and provide remedial teaching, to generate instructional material depending on the level of the student, to stimulate system of interest and to

store students' record. The Computer Assisted Instruction provides special type of learning environment and teaches successfully the written and visual type of content. The teacher has a peculiar role in this process to play.

This much theoretical and research-based support has really raised the following research questions in the mind of the investigator, to be answered regarding the efficacy of CAI in teaching-learning process.

- (a) Can CAI be useful to make teaching-learning process effective?
- (b) Can CAI be effective to raise the achievement level of the learners?

Looking at the above questions, the purpose of the present study is to examine the potential of the CAI in helping students in secondary schools to learn English as a second language. The study is intended using the computer as a tool to integrate teaching materials through the use of CAI to encourage students to learn English grammar more effectively. Further, it also focuses on how to learn English grammar more easily and to use it correctly.

5.1 RATIONALE OF THE STUDY

English is taught as a compulsory subject at all the stages, starting from V to XII standards of school education. The apprehension of National Curriculum Framework (NCF-2005) is very true in the context that, "If in the next five years we are not able to achieve considerable success in the teaching of English, we will face the political demand for all schools to become English medium...".

NCERT (2006), also reports that the failure of a large number of children in Class X examination on account of English is an issue of worry. Here, the failure of students is considered with respect to their poor achievement or performance in English subject. The existing syllabus of Std. IX has potential to build up a strong language proficiency in the students, which will help them a lot in pursuing their higher studies in future. But the poor performance of the learners at this level proves the significance of Std. IX English as a base for the upcoming standards in the ladder of education. Hence, the investigator has focused on developing CAI mainly in English grammar for Std. IX, which will be further helpful to the learners' at large scale in developing language proficiency.

Grammar is the study of words and the ways words work together; an invisible force that guides us as we put words together into sentences. Any person who communicates using a particular language, consciously or unconsciously becomes aware of the grammar of that language. This can be understood with the help of the following example given by Kohli (1984), “A writer has given a beautiful analogy to illustrate the use of knowledge of Grammar. Imagine two car drivers. The first driver knows only driving and nothing about the working of the engine. He feels helpless whenever there is some trouble with the machinery. The second driver knows driving and also understands the working of the machinery. The person who knows grammar is like this second driver. In case he is doubtful about the correctness of a particular thing, his knowledge of grammar comes to his rescue.” Therefore, to speak in a clearer and more effective manner one has to study grammar. If the person who wishes to communicate in an artistic manner with well-defined structures, he must go for the greater depth of understanding and proficiency what the study of grammar offers. Now a day, the situation of English grammar teaching needs to be strengthened through innovative approaches. Computer has been proved a useful tool under such approaches, as mentioned in various research studies. Computer as a medium, because of its suitable attributes can help in realizing the objectives of English grammar. Though Std. IX students are at formal operational level but learning English through grammar becomes the little bit abstract in the absence of sound effects, visualization and colours. Hence, the investigator has decided to develop a CAI for teaching and Learning of English grammar at Std. IX level.

Advancement of technology has influenced each and every aspect of human life. The system of education is not an exception. The objectives of education have also become multidimensional. CAI has unique features because it can store, retrieve and transform the information. Many researchers like Acharya (2005), Badiyani (2008), Das (1998), Patel (2009), Sakhiya (2006) and Zyoud (1999) have attempted to develop Multimedia packages i.e. Programmed Learning Material, Computer Assisted programs to enhance learning in English language. The studies further suggested that more packages and programs need to be developed so as to enhance the learning of English language, especially focusing on grammar. It is observed that most of the studies were conducted at school levels in different subjects for studying the effectiveness of Computer Assisted Instruction. No study was found focusing on the

English language subject covering the major hard spots of learning in English grammar based on the prescribed syllabus of Std. IX.

It seems that simply developing CAI for English grammar may not serve the purpose of quality improvement in English. It necessitates identification of the major hard spots of learning especially in English grammar basically to serve as the basis for the development of CAI. Hence, the investigator identified the major hard spots of English grammar on the basis of the opinion of some experienced English teachers.

A logical analysis of the reviewed studies revealed that most of the CAI developed in English language under the studies were in the form of Microsoft PowerPoint presentations. They were lacking the inclusion of innovative approaches based on the integration of applications like animation, visualization, colour, sound and imaginary effects etc. Hence, the investigator has decided to integrate all such applications in the development of CAI under the present study.

5.2 STATEMENT OF THE STUDY

Development and Effectiveness of Computer Assisted Instruction in English Grammar for Standard IX Students

5.3 OBJECTIVES OF THE STUDY

The present study was designed with a view to achieving the following objectives:

- i) To identify the major learning difficulties in English grammar for the students of Std. IX as perceived by the teachers.
- ii) To develop Computer Assisted Instruction (CAI) in English grammar for Std. IX students.
- iii) To study the effectiveness of the Computer Assisted Instruction (CAI) in terms of achievement of the students in English grammar.
- iv) To study the reactions of the students about the developed Computer Assisted Instruction (CAI) in English grammar.

5.4 VARIABLES OF THE STUDY

Under the present study, the following variables have been taken into consideration:

- i) **Independent Variable:** - Computer Assisted Instruction (CAI) in English

grammar was considered as the independent variable under the study.

- ii) **Dependent Variable:** - Students' achievement in English grammar was considered as the dependent variable under the present study.
- iii) **Control Variables:** - Different variables like Type of schools (Grant-in-aid), Area of the schools (Urban), Medium of the schools (Gujarati Medium), Age group of the students (14-15 years), Standard of the students (9th) and Previous scholastic achievement of the students were controlled under the present study.

5.5 HYPOTHESES OF THE STUDY

- i) There will be no significant difference in the mean achievement score of the experimental group in pre-test and post-test.
- ii) There will be no significant difference in the mean achievement score of the control group in pre-test and post-test.
- iii) There will be no significant difference in the mean achievement score of the experimental group and control group in post-test.
- iv) There will be no significant difference in favourable and unfavourable reactions of the students of the experimental group regarding the implemented CAI.

5.6 EXPLANATION OF THE TERM

- **CAI in English:**

CAI in English based on grammar refers to the Computer Assisted Instruction Package developed by the investigator using various software like Macro Media Flash, Page Maker, Adobe Photoshop and Coral Draw to teach English grammar to the students of Std. IX. The CAI is based on some grammar teaching points which were identified as the learning difficulties of the students on the basis of the opinion of a group of experienced English teachers. The CAI is based on the identified grammar points viz. Articles, Prepositions, Conjunctions, Quantifiers, WH – questions, Question Tag, Types of sentences, Modal Auxiliaries, Degrees of Comparison, Simple Past Tense, Present Perfect Tense, Past Perfect Tense, Adverb Clause of Result, Active – Passive Voice and Reported Speech. The developed CAI includes the explanation of various topics with examples, exercise, self-practice and self-evaluation items in different formats. It includes almost all the grammar teaching points of standard IX. This developed CAI is a multi-faceted learner-centered design based on important

principles mentioned below.

- Integration of instruction, practice, assessment and feedback.
- Integration of Instructional material for active engagement of the learners.
- Integration of focused personalised cognitive efforts
- To support mastery learning through individualized learning.

5.7 OPERATIONALIZATION OF THE TERMS

- **Achievement:**

Achievement means the marks obtained by the students of Std. IX in the achievement test based on English grammar.

- **Effectiveness of CAI:**

Effectiveness of CAI was judged on the basis of the significant difference in mean achievement scores of the experimental and control groups in the post-test.

5.8 DELIMITATION OF THE STUDY

The present study was delimited to the students of Gujarati medium Grant-in-aid secondary schools of Vadodara city, following the prescribed syllabus of Gujarat Secondary and Higher Secondary Education Board (GSHSEB).

5.9 POPULATION OF THE STUDY

There were total four clusters of schools in Vadodara city known as ‘Shala Vikas Sankuls’ (SVSs). There were total 106 Gujarati medium Grant-in-aid secondary schools divided under the four SVSs. Thus, total 8104 students studying in these schools constituted the population for the present study.

5.10 SAMPLE OF THE STUDY

Sample for the present study was selected purposively considering the nature of the study and bearing in mind the feasibility aspect of the experimentation, data collection and with the intention of getting all the necessary facilities in the schools. First of all, the list of Grant-in-aid Gujarati medium secondary schools of Vadodara city was collected from the District Education Officer (DEO) office, Vadodara. Then considering the availability of necessary facilities like full-fledged computer lab and

separate classroom with LCD projector, two schools (Jeevan Bharti School and Narayan School) were selected purposively with the consent of school management. An intact class of Std. IX from each school was considered as the sample for the present study. There were total 66 and 58 students respectively in class IX of the selected two schools. The group of students from Jeevan Bharti School was treated as the experimental group whereas the group of students from Narayan School was treated as the control group. Also, a group of 22 students of standard IX studying in Vallabh Vidya Mandir were selected for the initial try--out of the CAI.

5.11 DESIGN OF THE STUDY

The design of the present study was Quasi-Experimental Design under the Experimental research study. Under this, the 'Pretest – Posttest Non-equivalent Group Design' was adopted. Best and Kahn (2000) describes, "*This design is often used in classroom experiments when experimental and control groups are such naturally assembled groups as intact classes, which may be similar.*" The design of the study is presented as follow.

O ₁	X	O ₂
O ₃	C	O ₄

Where, O₁ and O₃ are pre-tests

O₂ and O₄ are post-tests

X stands for Experimental Group and C stands for Control Group

5.12 PLAN AND PROCEDURE OF THE STUDY

The study was conducted in seven different phases. The phase-wise detail has been described as under:

Phase I – Semi Structured Interview

This was the pre-phase activity carried out prior to the development of CAI. Under this phase, the investigator conducted a self-constructed semi structured interview on 15 experienced English teachers to identify the major learning difficulties of the students in English grammar as perceived by them. Thus, investigator identified

major learning difficulties in English grammar, which were considered as the base for the development of CAI.

Phase II – Development of CAI

Prior to develop the CAI, content of the English textbook (Std. IX) was analysed and all the microteaching points were identified. On the basis of that, a list of major grammar points was prepared. Then the identified major difficult teaching points under the phase-1 were considered as the basis for the development of CAI. Further, the following criteria were kept in mind for the development of CAI.

- f) The CAI should be based on identified major learning difficulties of the students in English grammar.
- g) The CAI should be included explanation of various grammar points with examples, exercise, self-practice, self-evaluation and feedback in different forms.
- h) The CAI for each grammar point should be based on a prepared content brief and an interesting script.
- i) The CAI should be based on audio material, visuals in different forms and audio-visual content with animation, images, sound and colour effects.
- j) The CAI should be developed by using a variety of software like Macro Media Flash, Adobe Photoshop, Corel-Draw and Page Maker.

After identification of the major learning difficulties of the students in English grammar, the main teaching points were decided for the development of CAI. Based on that the content brief for each teaching point was developed, which was the major base for preparing an interesting script of each episode under CAI. To prepare the interesting script for each teaching point under CAI, experts help was taken. Then with the support of animation experts, the initial form of CAI was developed. After that, the developed CAI was validated on the basis of the experts' opinion with reference to the mode of presentation, appropriateness of continuity and relevance of the content. To justify the validity of the developed CAI, a group of English teachers and some animation software experts were included in the team of experts.

Phase III – Initial Try-out of CAI

To ensure the educational value of the CAI package, it was initially tried out on a group of 22 students of standard IX studying in another school. While initial try-out of CAI, students' opinions were received regarding its efficacy. On the basis of an informal discussion with the group of students, necessary modifications were made.

Phase IV – Administration of Pre-test

Under this phase, a Pre-test (an achievement test in English grammar) was administered to the students of Experimental and Control groups, with a view to measure their achievement level in English grammar. The data in terms of achievement scores of the students were collected under this phase for both the groups.

Phase V – Implementation of CAI

The developed CAI was implemented only in Experimental Group, under this phase. As per the Schematic Presentation for the Implementation of CAI, it was implemented for total 84 periods, under this phase.

Phase VI- Administration of Post test

Under this phase, a Post-test (an achievement test in English grammar, which was used as a Pre-test) was administered to the students of Experimental and Control groups with a view to measure their achievement level in English grammar. The data in terms of achievement scores of the students were collected under this phase for both the groups, with a view to studying the effectiveness of the implemented CAI.

Phase VII- Administration of Reaction Scale

A five-point reaction scale was administered to the students of experimental group mainly to study the reactions of the students regarding the implemented CAI. This was mainly to judge the effectiveness of CAI on the basis of their reactions.

5.13 TOOLS FOR DATA COLLECTION

The following major tools were constructed by the investigator and used for the collection of data under the present study.

(i) Achievement Test

The achievement test was constructed on the basis of the identified teaching points of English grammar viz. Articles, Prepositions, Conjunctions, Quantifiers, WH – questions, Question Tag, Types of sentences, Modal Auxiliaries, Degrees of Comparison, Simple Past Tense, Present Perfect Tense, Past Perfect Tense, Adverb Clause of Result, Active – Passive Voice and Reported Speech. This achievement test was used as pre-test and post-test with a view to know the achievement level of the students in English grammar. Students' achievement level in English grammar was judged on the basis of marks obtained in the achievement test. The constructed achievement test was validated on the basis of the suggestions given by a team of English teachers.

(ii) Reaction Scale

A Likert type five-point reaction scale was prepared by the investigator to study the reactions of the students of the experimental group regarding the implemented Computer Assisted Instruction Package. The reaction scale includes 28 statements covering various aspects related to its construction, implementation and experiences of the students. The five-points of reaction scale were: 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. According to the students' reaction towards each statement, students were supposed to indicate their reaction by putting a tick mark (✓) in any one appropriate box out of the given five provided options. Reaction scale was validated on the basis of the suggestions given by seven teacher educators having proficiency in the construction of tools.

(iii) Semi Structured Interview for Teachers

A Semi Structured Interview Schedule consisting of a series of nine questions developed by the investigator to identify the learning difficulties of the students in English grammar, as perceived by the teachers.

5.14 PROCEDURE OF DATA COLLECTION

With a view to collect the data in terms of students' learning difficulties in English grammar, students' achievement level in English grammar and their reactions about the implemented CAI; the above stated tools were employed in a logical

sequence. First of all, semi structured interview was conducted on a group of English teachers with a view to identifying the learning difficulties of the students in English grammar as perceived by them. On the basis of this, the major teaching points of English grammar were identified and decided to use them as the basis for the development of CAI.

Then to collect the data in terms of students' achievement, pre-test and post-test were administered as mentioned in Phase-IV and Phase-VI. Thus, the quantitative data in terms of achievement score were collected. After that to study the effectiveness of implemented CAI, students' reactions were collected by employing a reaction scale. Thus, the qualitative and quantitative data were collected and analysed further to draw out the findings.

5.15 PROCEDURE OF DATA ANALYSIS

As the students were selected through purposive sampling, nonparametric statistics was used for the data analysis. To test the stated hypotheses the data analysis was done with the help of Wilcoxon Signed Rank Test, Mann Whitney U Test and Intensity Index. And the data analysis related to the Semi structured interview of the teachers was done through frequency and percentage.

5.16 MAJOR FINDINGS OF THE STUDY

On the basis of the analysis and interpretation of the data gathered in the present study, following findings were derived.

- i) There was the significant difference in mean achievement score of experimental and control groups in post-test.
- ii) The teaching of English grammar through CAI was found to be effective in terms of students' achievement and their reactions.
- iii) The teaching of English grammar through CAI was found significantly effective than that of the traditional method of teaching.

5.17 DISCUSSION AND IMPLICATIONS

The findings of the present study showed that the developed CAI was significantly effective than the traditional method of teaching. Findings of the studies conducted by Badiyani (2008), Barot (2009), Hirani (2007), Maheta (2009), Mulbery

(2006), Nalayini (1998), Panchal (2006), Patel (2009), Rathwa (2007), Rose Antony Stella V (1992), Sakhiya (2006), Tyagi (2013) and Zyoud (1999) have also supported the findings of the present study. It may be due to, the teaching through traditional method does not take care of inclusion of more senses of the students compared to any other innovative method. The research study conducted by Patel (2009) on development and implementation of CAI to teach English grammar for Std. VIII students had also revealed the higher achievement of the students in English grammar.

Based on the reactions of the students, it was revealed that the CAI was found effective. Besides this, the said outcome has also been observed by the investigator on the basis of students' active, curious and enthusiastic attitude while learning with the help of CAI during the experimentation. They were fascinated by the inbuilt innovations under the CAI like the use of animated videos, graphics, sound effect, exercises, activities for practice and getting immediate self-feedback etc. The students' favourable reactions towards the implemented CAI may be because of the above innovations.

Looking at the reaction scale used as a tool for the collection of data in terms of students' reactions with a view to studying the effectiveness of CAI, it can be said that the multifaceted nature of the statements covered under the reaction scale has justified the internal validity and educational implications of the developed CAI. Also, the data collected through the semi structured interview of teachers had been very much useful to ensure the internal validity of the CAI in terms of the selection of grammar teaching points.

But sometimes, it may be an exaggeration in saying that, the significant difference in achievement of the students in English grammar is just because of the implemented CAI. During the course of study, the investigator realized the importance of some moderating variables like students' previous knowledge, their interest and inclination towards learning English grammar, teachers' competencies, availability of resources to learn English etc. It seems that to ensure the internal validity of the experimental treatment, the above variables have also taken into consideration during the course of study.

Also, with reference to ensuring the external validity of the experimental treatment, the replication of the experimental procedure should be done three to four

times on different samples to see the consistency in results. But due to the constraints like time, money and energy that could not be possible. Hence, looking to the above internal and external validity related aspects, further extensive research work can be done in the same area. But ultimately, the investigator found that the study was suggestive and revealing.

Looking to all above it can be said that the developed CAI can be useful to the students not only to enjoy the learning process but also to develop the proficiency in English language. The basic idea adopted here that is, integration of technology in education serve the purpose of quality-based education, especially for the English language. The further dissemination of the developed CAI to facilitate the secondary education in the state would be a desirable step towards the quality education in English. It is obvious that CAI cannot take the place of English curriculum but, it can be the best supplementary instructional material for the students having individual differences. Providing this type of supplementary material to all the students in the entire state free of cost then it would be the great step which would prove to be a wonderful educational implication of the developed CAI.

5.18 SUGGESTIONS FOR THE FURTHER RESEARCH

With reference to the experiences gained during the course of the research study, the investigator would like to give following suggestions for the future research studies.

- An experiment with the students from the different cultural background such as rural and urban areas is needed to study the effectiveness of CAI in comparison with various teaching methods.
- Researchers should undertake research studies to determine the efficacy of CAI in comparison with different teaching strategies in different subjects.
- Researchers should undertake research studies to determine the effect of various types of CAI on different subjects and in different standards for different types of schools.
- An advanced CAI package based on 3D and digital mode can be developed for the teaching of English grammar and its effectiveness can be studied.
- An experimental study can be done to see the effectiveness of CAI in different subjects for different target groups for the purpose of diagnosis and remediations.

- To study the impact of institutionalization of CAI packages under the pedagogical practices in the present education system.

5.19 CONCLUSION

The present study concluded that the CAI package was found effective in terms of students' achievement in English grammar. It clearly envisages the significance of such innovations mainly to improve the quality of education at school level. It further reveals that CAI can be used along with the conventional classroom teaching to make teaching very effective, interesting and develop a deeper understanding of the subject. It can facilitate the learners to develop their interest, inclination and self-confidence towards the English grammar. Development of such kind of CAI packages can help not only to the students but also to the teachers to integrate them in the teaching-learning process, so as to achieve the instructional objectives.