CHAPTER I
INTRODUCTION

The excessive verbalism in the conventional method of teaching has lost its efficacy and students' interest in subjects. Studies on teaching effectiveness (Rossen Shine Frust, 1971) and effectiveness of educational programs (Gorden, 1971) indicate that the following attributes should be included in the instructional environment:

(a) Frequent feedback to learners
(b) Tutorial relations
(c) Individual pacing
(d) Individual programming
(e) Clarity of presentation
(f) Motivational factors
(g) Variability in classroom activities
(h) Enthusiasm
(i) Task Oriented or achievement oriented instructions

The standard of education is generally low in schools, due to a lack of the above mentioned attributes in the teaching-learning process in the classroom. (Adinarayanan 1990). Many of the above attributes can be provided by modern technology.
Technology has helped to improve the quality and pace of activity as well as production in most aspects of human endeavor. Scientific discoveries and technological advancements have changed the pattern of life of nearly all human beings; only the extent of change differs from one society to another or for classes of people in a society. Since education involves a very large number of human beings and directs the lives of all, it cannot ignore changes in the environment. Schools have no option but to take advantage of it or else they will become obsolete as did 'path shalas' and 'madrassas' a century ago.

The computer is one of the most important and outstanding inventions that has made an increasing and powerful impact on the working methods of research and development in the field of science and technology and has revolutionized everyday social life in the advanced countries of world. Computers are being used in the areas of transportation, communication, national defence, food and material production, scientific research and education, in western countries. We, in India, have also imported this highly developed technology.

Till recently, computers were used in India mainly for storage and processing of data. If we can put the information handling power of the computer at the disposal of teacher and pupil, we open up the possibility of a revolution in education.

Skinner (1968) observed, "It seems that one of the factor of inefficiency in the present system of education is because we teach a set of students at the same rate. It is not only
unfavorable to the student who can pace himself faster in a course of study, but more so to a slow learner. A slow learner is not necessarily a dullard, but he starts lagging behind in studies as he is unable to move at the speed of the instructor, with a properly structured self-paced course, a slow learner can rise to a good level of performance”.

Although educators have long supported the principles of individualised instruction, they have in general, done relatively little towards implementing these principles. Most individualised instructional efforts so far have concentrated on self-pacing alone, indeed instituting even that change requires individualised scheduling and quite extensive records. Furthermore, when we go beyond self-pacing into providing different instructional objectives for different students, into program branching, and into letting some students select their objectives and the learning resources needed to obtain them, the records and scheduling problems become immensely complicated. For these reasons, educators are beginning to take a serious look at computers as the only practical and available long term solution to such problems.

Computers allow a large variety of contents and symbolic modes ranging from printed word to dynamic scheme, from graph to musical notation, and from realistic picture to dance notation, while all other instructional technologies are restricted to a particular kind of symbol systems (words, picture, number, space, tone etc.) and hence to a limited range of
contents. Computers differ from other technologies in a variety and kinds of activities that they afford ranging from responses to question as in drill and practice programs, to autonomous hypothesis testing in simulation, from discovery like activities via game playing to rigorous logical planning in programming and from writing and revising to categorizing and calculating. No other technology known to us allow such a wide variety of contents, symbol modes and learning activities.

Apart from these, there are many other unique attributes of computer in curricular use (Daswani, 1990). Some of them are:

- Unlike books, tapes, films, radio and television, children find computer interesting and attractive as it is interactive. The user determine what happens next.
- It is part of human psychology to respond to challenges, to make things happen, with the computer by pressing the right key the child can make a picture appear in the program.
- Computers have infinite patience. The computer does not scold as the child produces a scribble in attempting to write. It does not rush if the pupil writes slowly. It does not worry how often it has corrected the same mistake earlier.
- Children enjoy learning through computers since computers take them seriously and do not talk down to them. So computer enhance self concept.

- Computers provide privacy. Children hate making embarrassing mistakes in front of the class. With a computer, the lack of skill, slowness in comprehension, poor co-ordination can be overcome in privacy and the computer does not make personal remarks.

- Computer is full of surprises. A book that is read holds no more mystery, whereas in a branching program the pupil can try out new things, leading to new endings to the story.

- Computers can simulate. Simulation can train better than a whole lot of talk. It also helps lateral thinking.

- There is no delay and the reinforcement is immediate. The child does not have to wait for its turn with the teacher or until after the homework is corrected.

With the economic computers available, the development of better and more diversified learning material designed for personal computers, and the above said unique attributes of computer, there has been an impressive growth in the use of computers in schools all over the world. Computers, it
is felt, ought to be an integrated part of the ongoing life in school much like the pencil and the book. No human teacher ever born, no method or media yet tried, can match the computer's capabilities.

The critics see the computer as an agent of destruction of human qualities. They claim that no computer can ever match the spontaneity, the versatility and the emotional caring of a human teacher. It is important to notice that no one is talking of excluding the teacher from the classroom when the computer is introduced and phrases like the 'automation of education' are therefore misleading. The teacher is simply being released from some of the chores of information processing, just as he was previously released from some of the chores of information transmission by a widespread use of books. It is notable that those who are developing computer techniques for the classroom speak not of 'computer controlled education' but of 'COMPUTER AIDED INSTRUCTION' (CAI). The overall control of computer aided instruction remains with the teacher.

1.1 WHAT IS COMPUTER AIDED INSTRUCTION

There are two basic forms of computerized instruction used either independently or mutually supporting roles. We distinguish these forms of instruction as CAI meaning Computer Aided Instruction, and CMI, meaning Computer Managed Instruction.
Speaking broadly, CAI is the use of a computer to interact directly with a student for presenting lesson content and testing student's progress. Because of the computers' flexibility and capacity to provide branching instruction, it can assume the guidance role of a patient tutor or instructor, while also providing the student with necessary reference materials, simulated laboratory facilities or clerical services depending upon the capabilities of the computer and the terminal used by the students. Some of the applications of CAI are to display lesson material, provide drill and practice, reinforce learning, simulate environmental conditions and display a relevant stimuli and administer tests. CMI uses the computer as an aid for the course developer to identify and measure relevant students' characteristics, lesson characteristics, help in design of diagnostic tests, control students' access to lesson material, redirect students to alternate course lessons, and provide complete data on the progress of individual students or group of students.

Fig. 1.1 shows schematic representation of the instructional situation. In this we have essentially two channels of information flow one from the instructional agent (human, programmed instructional booklet, computer) to the student, and other from the student to the instructional agent. The
information flow and display from instructional agent stops at the dotted line, whereas it is either accepted or rejected or to a degree determined by the student who then makes use of this information and reads out on the test channel what his transformation of that material means to him. His direct control then stops at the dotted line in the channel below. It is at this point that instructional agent takes control. It can accept all or part of the information deriving from the student, from the subject matter being taught, from the circumstances currently obtaining in the situation and so on.

Once we can identify the area of control (direct and indirect control of who and what), we should be able to develop, within a highly (computer) controlled educational and training environment, a better model or models of instruction than can be demonstrated by the human instructor. In fact, this must be the case if CAI, with its expensive central computer and peripheral hardware, is to prove its utility in education and training. We are committed to the rational belief that CAI must be capable of accomplishing this improvement in the instructional models, since the storage and retrieval capacities as well as the attending and evaluative capacities of the computerized model can be made vastly superior to those of the unaided human beings.
1.2 COMPUTER AIDED INSTRUCTION IN INDIA

Children who pass out from schools after a couple of years are going to be in an environment where computers will be very common. Many of them will have to interact with computers. Most of them will have to take decisions based on information provided by computers.

In 1982, the Indian government realised this fact and decided that computers must enter our schools. The National Council of Educational Research and Training (NCERT) set up a project "Computer Literacy And Studies in School (CLASS)". They formulated the objectives of CLASS as a program which would make children aware of what computers were, how they worked, what they could do and how to make them work.

According to A.K. Jalaluddin, Joint Director, NCERT (Dec., 1985), "The pilot phase of the CLASS project will conclude in June 1986. In addition to 250 schools covered under the project in 1984-85, another 500 schools have been included in the current year. More than 700 teachers from the new schools have already been trained now. Machines have been installed under the CLASS project, 2250 Government Schools were provided Micro Computers up to the end of 1986-87". The report on the implementation of National Education Policy (March 1988) recommended that 13,000 schools be provided with computers having 5 to 8 computer terminals.
FIG. 1-1 THE INSTRUCTIONAL SITUATION
(SCHEMATIC REPRESENTATION)
India is trying to cope up with the speed of the present technological age. Having understood the importance of imparting computer knowledge to the teachers, the program of action of the National Policy on Education (1986) has planned to provide computer literacy to all the higher secondary schools by 1991, secondary schools by 1995 and elementary schools in the long run. State Institutes of Educational Technology are being set up in the States of Andhra Pradesh, Bihar, Gujrat, Maharashtra, Orissa and Uttar Pradesh to generate educational software for the children. Software is being developed both in the public as well as the private sector.

According to Sugata Mitra of United India Periodicals. "All the schools and every child should be exposed to computers by the year 2000 AD".

Most of the efforts, as at present, are invested in providing computers, training teachers and producing software. Few research studies have been conceived to investigate its actual use or effort on teaching-learning. Considering the money that is being or planned to be invested in computers, research needs to be undertaken regarding the use and effectiveness being made of this costly technology.

1.3 STUDY HABITS

The task of learning is not dependent on teacher alone. It is not only teacher's responsibility but it is also the responsibility of the pupil. Efficient learning depends not only on
good teaching alone but on satisfactory learning procedures also. Efficient learning depends upon the learner's ability to schedule his time, the plan of his study, the habit of concentration, note-taking, mental review, over learning, the judicious application of whole and part method, massed and distributed learning and so on. In other words, learning involves the development of proper study-habits and skills. According to Good's dictionary of Education, Study habit is the tendency of a pupil or student to study when the opportunities are given, the pupil's way of studying whether systematic or unsystematic, efficient or inefficient etc. Thus, study habit implies a sort of more or less permanent mode or method of studying. Individuals have their own way of studying. It has also been found that those who have good study habits, excel others of equal intelligence in academic achievement.

The problem of study habit is one of immense importance both from the theoretical and practical points of view. Theoretically, efficient learning depends upon the development of efficient study-habits and skills and as such one of the continuous objective of teaching should be the improvement of study habits and skills of the students. From the practical point of view, The problem is all the more important. Very often, teachers come across such students who appear to have above average scholastic aptitude, yet they are doing very poorly in their courses of study. A large majority of these seem to have faulty study habits. Proper guidance to them would, it is expected change their faulty study habits into desirable ones. As
much study habit is important for higher academic achievement of students as much it is important for their fruitful use of leisure time. Thus 'study habit' as a habit is generic than specific in terms of its importance. It has very long reaching effects deep into the life of the individuals and by cumulative and interactive effects in the society (Jamuar 1974).

1.4 CLASS ROOM ENVIRONMENT

Families and class rooms are two of the most significant learning environments that influence students' school environment.

According to Good's Dictionary of Education, classroom climate/environment includes heat, light, seating, individual differences among the members of the group, teachers personality and teacher pupil relationship. In general, it may be said that the classroom climate/environment could include the physical, social and psychological dimensions.

Class environment plays an important role in the motivation of learners and also in boosting the morale of teachers. Teacher pupil interaction, pupil interaction, teacher's philosophy and his perception of his role are important factors affecting the classroom climate.

A classroom is a unique face to face group marked by interpersonal relationships among its members. These interpersonal relationships essentially include teacher-student relationship and peer relationships. The general atmosphere
within which the academic activities take place is influenced by these relationships.

In a typical school class, the teacher deals with forty to sixty individuals which constitute a group. This group which is initially formed for academic purposes only, starts taking shape as personal-social group as a result of work organization and social interactions among its members. The personal-social interactions determine the overall climate of the classroom. The degree and nature of these processes and interactions vary from classroom to classroom.

The work organisation and interpersonal relationships can be identified at two levels, namely, the formal level and informal. At the formal level, the activities and interpersonal relations exhibit planned pattern of work organisation. At the informal level the organisational patterns emerge out of the activities of and interactions in the group. But their relative prominence differs markedly from classroom to classroom. Some classes are formally structured with very little scope for spontaneous work-related activities whereas others function on informal structure. This makes each classroom unique and its climate different from that of others.

1.5 EMERGENCE OF THE PROBLEM

It is ought to be emphasized that the role of computers in curriculum, based on realization of their unique attributes, is still in its infancy. Organizational, psychological,
philosophical and financial hurdles are still to be overcome. Moreover wholesale and hasty integration of computers into well designed and tried curricula in some cases be more harmful than helpful. The research and accumulation of experiences may ultimately show us how best to reap the potential advantage of computers in education.

Compared to advanced countries very less research work has been done in India, in the field of CAI. Related research in this area has been discussed later, but it may be worthwhile here to mention that results of research studies are very divergent. Results of studies by Monteil (1980), Aelillo (1981), Tarrant (1982), Lovelace (1982), Bradley (1983), Dursky (1983), Vezquiz (1983), Merell (1984), Durnin (1985), Hawley (1985), Stefen (1985), Ayoubi (1985), Bennet (1985), Thomas (1985), Girdhari Lal (1986), Hayden (1988), Yarbrough (1988), Wetherbe (1989), Reeve (1989), Webster (1990), Dungan (1990) and Mahajan (1993) are in favour of Computer Assisted Instruction. Studies done by Jamison (1974), Jackson (1976), Tisone (1985), Davidson (1985), Melniko (1986), Hakes (1986), Vanlengan (1988) and Canady (1990) show that instructions through computer have no significant effect. Studies by Levy (1982), Fox(1986) and Cosmos (1988) show that traditional teaching is better than Computer Aided Instructions. These divergent results can be due to many reasons. One of the reason is that there are certain factors that affect the achievement of students and were not taken into consideration. In the present study, the investigator has tried to study the effect of two factors, i.e., study habit and
classroom environment on Computer Aided Instruction. This study is in the area of CAI. The problem under study is stated as:

"Effectiveness of Computer Aided Instruction on achievement in Science in relation to classroom environment and study habit at the school stage."