

C H A P T E R - I I

R E V I E W O F R E L A T E D  
L I T E R A T U R E

- A : STUDIES REGARDING COMPUTER AIDED  
LEARNING AND TRADITIONAL LEARNING  
AND THEIR COMPARIS ON
  
- B : STUDIES REGARDING VIEW AND OPINION  
ABOUT THE COMPUTER USE.
  
- C : OTHER STUDIES

## CHAPTER - II

### REVIEW OF RELATED LITERATURE

#### INTRODUCTION

Now there is great need to take a critical account of educational situation in India from all aspects like organisation curriculum teaching techniques and the approach and awareness of the people in general and vocational experts in particular regarding new developments in the field of education, science and researches have been helping in the advancement of knowledge in many aspects. The investigations and studies affecting the knowledge and attitude requires to be examined thoroughly.

In this chapter, review of related literature regarding the use of computer for teaching, studies regarding view and opinion about computer use and other related studies have been studied. It will be included under following groups :

- A) Studies regarding computer aided learning and traditional learning and their comparison.
- B) Studies regarding view and opinion about the computer use.
- C) Other studies.

A) Studies regarding computer aided learning and traditional learning and their comparison

At present, the teaching learning process dominated by the teachers activities. That is to say the teacher is active and the students most of the time are passive. This has led to dissatisfaction both among teachers and students. Researchers have attempted to design the teaching-learning process in such a way so that it is dominated by the child rather than by the teacher. In the traditional classroom the teaching is group-based whereas in computer aided instruction, it is student based in the traditional teaching there is hardly any mechanism with the help of which the teacher can find whether the students are understanding what the teacher is teaching. The speed of presentation in the traditional teaching is at times much higher than the comprehension of the students.

Stanley Rothman and Charles Mosmann (1972) examined the use of computer in Medical, Industrial and Education. In this respect they conclude that - (i) computer-based systems begin by doing things that can also be done by other means, but end up being closely integrated in many operations, so that the enterprise could hardly continue without them,

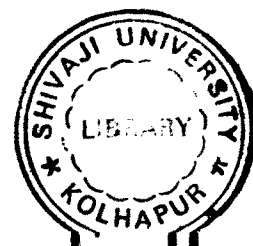
(ii) Computers are applied because it appears they will further the aims and objectives of the enterprise making it faster, cheaper, better or safer, (iii) But some of the consequences of their applications (on employment or privacy, for instance) impact on a much larger social sphere than the enterprise itself. U.K. Banerjee (1987) discussed the importance of computer in the management and planning of the industrial unit. In the first part a critical account of computer scene in India and the future of computers is discussed. In the part two he elaborates in detail the computer application staffing and staff-setting, personal management, cost management and training. In the third section, he discusses computer application in planning. In the fourth section, the effects of computer on security, computers and audit and on ethics has been discussed. In the appendix he presented organisational chart for computer centre.

Dhothrad, S. (1990), Kamat, S. (1990), Khochage, B. (1990), Patil, J.A. (1990), Patil, T.U. (1990), Khot, P.J. (1992) in their dissertations for the Master's level studied the use of computers in teaching and learning of various school subjects. They used the experimental design and compared the learning through computer with the traditional

classroom method and found that better and faster learning occurred with the use of computers.

Kulik, Kulik and Cohen, (1980) conducted a meta-analysis of fifty nine independent evaluations of CBE uses at the college level and reported findings related to student attitudes and instructional time which are summarized as follows : (i) The computer has made a small but significant contribution to the effectiveness of college teaching raising examination scores by about 0.25 standard deviations (a change that was noticeable in high aptitude and low aptitude students as it was in average students), (ii) CBE has had small but positive effects on attitude of college students towards instruction and toward subject matter, (iii) In a few cases CBE has had a strong, positive effect (Cartwright, Cartwright and Robine, 1972, Grandey, 1970, Roll and Pasen, 1977), (iv) CBE produced learning in about two-third of the time required by traditional instruction and (v) accomplishments of CBE must be considered modest at the college level.

Sharma, D.K. and Garg, C. (1979) reported that school going children learnt mathematics very quickly and logically through computer Instructed Learning in comparison to traditional teaching methodology given to the computer.



The computers can handle the knowledge to some extent through computers Models of reasoning but she warns that although such techniques can be very powerful they should always be seen as complementary to, rather than a substitute for human intelligence.

Meek, B.L. and Fairthorng, S. (1977) pointed out two basic situations in computer aided learning (CAL). (i) Where the program offers various options and facilities to the pupil, who chooses between them and guides himself through the process, (ii) The other situation is where the program in effect has control, sets out to teach the pupil something and, by presenting information and asking questions, decides whether the pupil is showing sufficient understanding at a given stage. If so the program goes on, if not it repeats the item or presents it in a different way. Often the term CAL is reserved for the first of these and CAI, Computer Aided Instruction, for the latter, but as the two can be intermingled one term can be used for both. A combination of the two is probably best. Since the most effective educational situation occurs when there is a partnership between teacher and pupil, together sharing decisions about how to proceed.

Hart Anna, (1988), pointed out that basically the process start decision making of a human being and of the

computer is similar. We human being take the decision on the basis of knowledge while the computer take the decision on the basis of the program.

B) STUDIES REGARDING VIEW AND OPINIONS  
ABOUT THE COMPUTER USE

Horn, C.E. and Poirot, J.L. (1985) highlighted the importance of computers in various fields like education, economics, engineering, medicine, ergonomics (The study of workers in relationship to physical environment). In his opinion the computers helps in communicating the information in society and it brings together the world society.

Semour, S.L. and Others (1986) investigated the effects of medium of instruction, task difficulty and gender on continuing motivation. A total of 139 fifth and sixth graders with previous computer experience completed an initial learning task in one of the two media formats (computer or paper pencil) and either a hard or easy difficulty level. Subjects choice of instructional medium for a second learning task was the measure of continuing motivation. Sixty-seven of the 69 computer subjects (97%) choose to return to the computer, whereas only one to the paper pencil form. The remaining 69 choose the computer for

the second task. Questionnaire data indicated that computer subjects also evaluated their own performance significantly more highly, reported the task to be significantly more interesting and easier and had a greater desire to study more the same type of subject matter.

Yeaman, A. R. J. (1986), reported theory of person environment fit predicts unhealthy strain caused by mismatch between factors external to the individual and those that are internal. In the study reported here, the theory of person environment fit was applied to assess student well-being in a university computer room. A qualitative approach was chosen for this study and a conceptual framework was constructed using Miles and Huberman's technique (1984). A script of questions and probes was prepared from the conceptual framework. Twelve volunteers from a computer literacy course were interviewed. Both objective and subjective data about physical and psychological stressors were obtained. Some insights into learner environment fit are already available, although the results reported here must be regarded as preliminary. Early data cuts suggests educational computing tasks, while less frequent and shorter duration, may be more intense pink collar VDT work, Repression may have been a part of the student view in accepting complexity. These defence mechanisms may also



indicate a learner role affect which explains student reactions to visual and muscular skeletal stressors. Better understanding of learner environment relations is being developed through monitoring interventions such as teaching students how to reduce computer stress, psychological dimensions are handled in a similar way. Caporaal identifies two important components in learning to use computers. Trial and error learning and computing as a social activity. Trial and error learning is reduced by several strategies; students are encouraged to save their work every 15 minutes at least to avoid accidental loss. Receipt sheets are prepared with instructional design principles to guide beginners through the basic steps of using a word processor, a spread sheet and a data base. Just as computer learning experience should increase student well-being and learning performance, so should any learning experiences and further analyses of learner environment relations may provide a faithful for that interaction.

Money, S. (1985) pointed out that considerable work has been carried out in the field of computer-assisted learning. In this application the computer acts as a form of robot teacher or individual tutor by providing a graded series of questions, often with multiple choice answers, which the pupil answers. According to the answer received

the computer selects a new display and further questions. When wrong answers are given the computer generally moves back to an earlier section of the material and provides revision work on receiving a correct answer the computer moves on to introduce new ideas or concepts.

The major advantage of this form of instruction is that the computer automatically adapts to the learning pattern of the pupil, so that a number of different pupils working at individual terminals are able to progress at their own speed without affecting the others in the group. Computers are often used as tools in subjects such as Physics, and in teaching Computer Science and Programming.

Hunt, R. and Shelley, J. (1984) pointed out the use of computer in the engineering and medical disciplines. Computer can help in calculating that all parts of proposed design. If modifications are necessary and further calculations are required, the computer can evaluate the alternatives more quickly and more accurately than would otherwise be possible. This means a great saving in time and elimination of technical faults and human error. Computers can also be used in calculations of space and layout as well as strength requirements.

When fitting the structural and spatial requirements of an engineering project into an overall design, the computer can also help with graphical output. The facility to view a design from all angles while it is still on the drawing board, and then to be able to modify it quickly, avoids having to spend time, and money building and testing several designs before determining which is the right one. The computer can provide graphical and perspective views to show the shape of a proposed aircraft wing or car body, the slope of a curve for a new road, the visibility that the pilot or motorist will have, or the accessibility of the instruments that he might have to operate. Computers are also used as an aid to electronic circuit design, even assisting engineers in designing circuits for other computers.

The uses of computer in the medical field are partly analogous to applications in business and industry. The computer being increasingly used in hospital administration for such tasks as maintaining inventories of drugs, surgical equipment, for pay-roll, hospital accounting and for bed allocation. Information on the condition of patients, details of tests and clinical reports may be stored on a computer system. This combined information can be used to provide ward and patient summary reports and where a terminal has been installed for the use of the ward nursing staff, the system can provide instructions and reminders concerning the care of individual patients.

In intensive care units the computer can be used to monitor a patient's condition. Scanning instruments attached to the patient are linked on line to the system so that nursing staff can be notified as the patient's condition changes. The computer may print out or display a log of the patient's condition, drawing attention to measurements that fall outside the critical limits set by the doctor, or the computer itself may trigger directly the necessary corrective action.

In some clinics the computer is used, albeit in an experimental way, to "interview" patient's before or after they see a doctor in order to collect information for the patient's records and even to assist with the diagnostic process. The computer may assist in medical diagnosis, for example, programs exist which can carry out electrocardiogram analysis to determine both normal and abnormal heart conditions. The computer system can act as a vast encyclopaedia of medical knowledge, providing the doctor with access to an ever-increasing quantity of information which he could not possibly hope to carry in his head. The computer may assist in prescribing the correct dosage and pattern of treatment, the computer has an important part to play in medical and in the teaching of doctors and nursing staff.

Hussain, K.M. and Hussain, D.S. (1989) reported following advantages of computer in professional course. Computers are tools that enhance the work of professionals while removing the tedium of many tasks. Information access is improved. Large amounts of data can be manipulated with speed and accuracy. The abilities of computers to answer "what if ?" questions, to simulate environments, to illustrate concepts through graphics, and to make inferences and intelligent deductions are among those used by professionals to great advantage. Intelligent computer systems are an aid to the professional, not a job threat at the present time of all groups in the work force, the professional gains most and risks least by the computer revolution.

Harn, C.E. and Poirot, J.L. (1985) pointed out that computers may be used to help increase business profits without increasing costs by quickly solving pay-roll, accounting, and inventory problems. Computing technologies assist in decision-making about purchases, customer needs, and the number of employees needed to perform job, computers can maintain files on the recent and past sales of a business and then logically project future sales. The costs of materials and standards for wages can be listed for easy access, and economic trends can be analyzed. Products can be designed with the aid of a computer, tested through

computerized simulation, modeled, and then evaluated for effectiveness. Orders for materials or equipment may be made over telecommunications lines using a standard telephone. Such computers keep records of the business inventory, what and how much is ordered, updated inventory, who made the sale, and the commission that is received for the sale. This same system can prepare the customer's bill and send the order to the customer. Many business and human labour hours are saved with this type of computer application.

#### C) OTHER STUDIES

The researcher has not come across any research, dealing with the attitude of any group of individuals towards computer use, and hence all the studies related in this section are not directly related but indirectly related to the present problem. These researchers have studied the attitude of groups / individuals to various factors. These studies of interest to us as they reveal to us how the attitude studies have been attracted by various researchers.

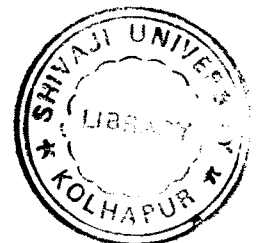
Allport (1954) considered attitudes as 'a mental and neural state of readiness organised through experience exerting a directive or dynamic influence up on the individuals response to all objects and situations with which it is related'.

Thurstone (1967) briefed his ideas in the following words, "Attitude is the effect for or against a psychological object". Thus effectiveness of any programme from TV would depend on the attitudes of the respondents.

Pupil and teacher attitude studies are quite common in behavioural science. The period under review is not strikingly different from the earlier one (Sinha, S.K., 1977) reported negative attitudes towards the present examination system using a Likert type questionnaire among university students, teachers and guardians.

Attitudes towards the students union among undergraduates was analysed and correlates were identified (family background, Self-concept, political affiliation etc.) Personality co-relates of attitudes and attitude change have been identified (Akhtar, 1970).

Upadhyaya, (1984), reported a comparative study of attitudes, values and motivation of pupil-teachers between Sanskrit and Hindi universities but the sampling and rationale cause concern for the validity of the findings. Jayakumari, (1981) assessed communal and inter-ethnic attitudes among post-graduate students representing different groups and demonstrated the presence of prejudice towards



other communities. Prasad, (1983) factor-analysed the attitude scales of nationalism, religiosity and demonstrated personality differentials in attitude components. Dani (1984) measured scientific attitudes sample of 1,265 students based on stratified cluster sampling as well as purposive sampling, alongwith their cognitive styles.

In general a large majority of students possessed positive scientific attitudes and certain correlates were identified using regression analysis. Attitudes of students towards alcoholism, communalism, corruption dowry and poverty were measured in relation to sex, educational level using random sampling procedures (Agarwal, 1984). Attitude score distributions on all issues were non-normal.

A series of studies dealt with attitudes towards physical education programmes in schools (Desai, 1986 ; Cerewal, 1986). Sex and educational level differences did not differentials attitudes but rural-urban differences were seen (Desai, 1986).