

# USE OF ICT IN TEACHING-LEARNING PROCESS

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## INTRODUCTION

Teaching-learning activities including the outcomes of interaction among teacher, student and education environment in accompany with technology make the process of learning more effective. In a virtual system of learning, technology replaces educational environment. Technological literacy is required for learning with technologies to be possible, implying a two-step process in which students learn about the technologies before they can actually use them to learn. However, there have been attempts to integrate the two approaches.

This is the age of INFORMATION dominated by the Digital Technology. The Digital Technology has influenced all aspects of human life. Education is not an exception. At present majority of devices are based on Digital Technology. One such device is Computer. The Computer is an electronic device that has the capacity to store, retrieve & process both qualitative & quantitative information fast and accurately. The computers were never developed for improving quality of teaching – learning process. But researchers started using Computers for teaching purpose. It gave birth to Computer Assisted Instruction (CAI), Computer Managed Instruction (CMI), Computer Based Instruction (CBI), etc. People started developing CAI for teaching different subjects at School as well as Higher Education level. The developed CAIs were compared with the Lecture Method / Traditional Method and found that the developed CAIs were significantly superior to Lecture Method / Traditional Method in teaching different subjects (Hayes, 1987 and Prabhakar, 1995). Further, the Traditional method of teaching was found to be more effective in comparison to CAI (Hulick, 1987 and Clem, 1990). The Model of Supplemental CAI was found to be effective in improving educable mentally handicapped students' achievement in Mathematics and Spelling (Ankney, 1987). Setting goals, following instructions, accessing information to accomplish the task, and evaluating performance benefited students with learning disabilities when they were engaged with CAI activities (McPherson, 1991). Older Adults successfully used the computer and were able to improve their knowledge about Health with a CAI lesson (McNeely, 1988). CAI had a positive impact on reading comprehension for average reader but not for teaching disabled readers (Trahan, 1989). In spite of benefit of CAI in different aspects of learning, CAI has not entered into the Classrooms as most of the developed CAIs were not based on sound Theories of Learning. People involved in developing CAI were not having the sound base of Instructional Design. Secondly, the courses are changing, the schools also do not have sufficient computer facility, teachers are not trained in the use of CAI, etc. The use of Computers was not only

for teaching but also for Psychological Testing, Evaluation; database Management, Library Management, etc.

## INFORMATION AND COMMUNICATION TECHNOLOGY

IT was limited only to the textual mode of transmission of information with ease and fast. But the information not only in textual form but in audio, video or any other media is also to be transmitted to the users. Thus, the ICT = IT + Other media. It has opened new avenues, like, Online learning, e-learning, Virtual University, e-coaching, e-education, e-journal, etc. Third Generation Mobiles are also part of ICT. Mobile is being used in imparting information fast and cost effective. It provides e-mail facility also. One can access it anywhere. It will be cost effective. The ICT brings more rich material in the classrooms and libraries for the teachers and students. It has provided opportunity for the learner to use maximum senses to get the information. It has broken the monotony and provided variety in the teaching – learning situation. The ICT being latest, it can be used both at school and higher education levels in the following areas:

- Teaching
- Evaluation
- Online Tutoring
- Instructional Material Development

### • USE OF ICT IN TEACHING

Teaching at School as well as Higher Education, mostly, concentrates on giving information which is not the sole objective of Teaching. Along with giving information, the other objectives are:

- developing understanding and application of the concepts
- developing expression power
- developing reasoning and thinking power
- development of judgment and decision making ability
- improving comprehension, speed and vocabulary
- developing self-concept and value clarification
- developing proper study habits
- developing tolerance and ambiguity, risk taking capacity, scientific temper, etc.

With the present infrastructure, class size, availability of teachers, quality of teachers, training of teachers, etc., it is difficult to achieve all the objectives. Further, most of the teachers use Lecture Method which does not have potentiality of achieving majority of above mentioned objectives. The objectives are multi-dimensional in nature, so for their achievement multiple methods should be used in an integrated fashion. At present ICT may be of some use. It is a well-known fact that not a single teacher is capable of giving up to date and complete information in his own subject. The ICT can fill

this gap because it can provide access to different sources of information. It will provide correct information as comprehensive as possible in different formats with different examples. ICT provides Online interaction facility. Students and teachers can exchange their ideas and views, and get clarification on any topic from different experts, practitioners, etc. It helps learners to broaden the information base. ICT provides variety in the presentation of content which helps learners in concentration, better understanding, and long retention of information which is not possible otherwise. The learners can get opportunity to work on any live project with learners and experts from other countries. The super highway and cyber space also help in qualitative improvement of Teaching – Learning Process. ICT provides flexibility to learners which is denied by the traditional process and method. Flexibility is a must for mastery learning and quality learning.

On INTERNET many websites are available freely which may be utilized by teachers and students for understanding different concepts, improving vocabulary, developing Reasoning & Thinking, etc. ICT can help in preparing students for SAT, GRE, TOEFL, etc.

- **USE OF ICT IN EVALUATION**

At present the paper pencil tests are conducted for evaluating the academic performance of students. These tests are conducted in the group setting. The content coverage is poor and students cannot use them at their own. These tests are evaluated by the teachers and they may not give feedback immediately to each and every student. It may be due to this that students are unable to know their weakness and do not make any attempt to improve upon them. The ICT can be made use in the evaluation. One such attempt has been made by Sansanwal and Dahiya (2006) who developed Computer Based Test in Research Methodology and Statistics. It has been titled as Test your Understanding: Research Methods and Statistics. This test can be used by individual student to evaluate his learning. The student can instantaneously get the feedback about the status of his understanding. If the answer is wrong, he even can get the correct answer. It goes a long way in improving the learning and teacher has no role to play in it. It is left up to students to use it. Such tests can be uploaded on the website for wider use. The students from other institutes can also make use of it. Not only the students even the teachers can also use it to assess their own understanding of the subject. If used by teachers before teaching the topic, they can prepare the topic properly. Such software can be used for internal assessment. Thus, ICT can be used to improve the quality of pre as well as in-service teacher's training.

- **USE OF ICT IN ONLINE TUTORING**

The digital technology has broken the foundries between countries. Human beings do not feel any type of restriction in communicating with people all over the globe. The access has become easy. It is a well-known fact that all students do not understand all subjects to the same extent. Some students find subjects, like, Mathematics, Physics, English, Chemistry, Accountancy, etc. difficult. All educational institutions do have well equipped laboratories and qualified & competent Faculty.

Consequently students do feel the need of academic support out of the school. Therefore, students go for tuition. These days students from USA & other countries are enrolled in private tuition classes in India. That is they are being taught Online. This has become possible only due to ICT. In Online tutoring the student stays at his home. He logs in to his tutor through the use of Internet and software. He can see the teacher who is in India and the teacher can see the student who is in USA. The student asks the question and teacher replies it by writing on soft board or using power point presentation. This interaction is normally one to one. It has made the academic life of many students easy. This is how the manpower available in India can be made use of other countries. Not only Online Tutoring but some of the students do outsource their assignments. These assignments are completed by the teachers of other country. Of course, academically it is not correct because the purpose of giving assignment is not achieved. The student does not develop academically and he may become weak in the subject. All this is happening just because of ICT.

#### • USE OF ICT IN DEVELOPING INSTRUCTIONAL MATERIAL

At present there is a shortage of qualified and competent teachers in all most all subjects at all levels. Not only this, even the instructional material available in the print form is not of quality. This is because many authors have written on those topics that they have never read and / or done research. Sometime the information given in the books is also wrong. The book reading is not very enjoyable and does not help students in understanding the concepts and retaining the information. There are many teachers who are well known for the specific subject. Their lectures should be digitalized and made available to all the users. It will enhance the quality of instruction in the classrooms. The teacher can use them in the classrooms and can organize discussion after it wherein the new points can be added both by the teacher as well as students. It will make the teaching effective, participatory and enjoyable. Sansanwal (2006) has done this. Sansanwal has developed digitalized lectures on Research Methodology and Statistics and has used it for teaching this subject at master's level. Other researchers are also using it. Of course, digitalized lectures will have their limitations of revision and inbuilt interaction. These lectures can be uploaded on any website and students & teachers can access any lecture they like.

Another form of digitalized lectures is e-content. The CEC is making efforts to develop e-content material in different subjects for the benefit of diverse users. The competent teachers can develop e-content in their own areas of specialization. This has lots of potentiality to bring quality in teacher education. The ICT can be used in developing Instructional Material and e-Content.

#### ROLE OF RADIO AND TELEVISION IN EDUCATION

Radio and television have been used widely as educational tools since the 1920s and the 1950s, respectively. There are three general approaches to the use of radio and TV broadcasting in education as follow:

- Direct class teaching, where broadcast programming substitutes for teachers on a temporary basis;
- School broadcasting, where broadcast programming provides complementary teaching and learning resources not otherwise available; and
- General educational programming over community, national and international stations which provide general and informal educational opportunities.

The notable and best documented example of the direct class teaching approach is Interactive Radio Instruction (IRI). This consists of –ready-made 20-30 minute direct teaching and learning exercises to the classroom on a daily basis. The radio lessons, developed around specific learning objectives at particular levels of math, science, health and languages in national curricula, are intended to improve the quality of classroom teaching and to act as a regular, structured aid to poorly trained classroom teachers in under-resourced schools. IRI projects have been implemented in Latin America and Africa. In Asia, IRI was first implemented in Thailand in 1980; Indonesia, Pakistan, Bangladesh and Nepal rolled out their own IRI projects in the 1990s. What differentiates IRI from most other distance education programs is that its primary objective is to raise the quality of learning—and not merely to expand educational access—and it has had much success in both formal and non-formal settings. Extensive research around the world has shown that many IRI projects have had a positive impact on learning outcomes and on educational equity. And with its economies of scale, it has proven to be a cost-effective strategy relative to other interventions.

In Asia, the 44 radio and TV universities in China (including the China Central Radio and Television University), University Terbuka in Indonesia, and Indira Gandhi National Open University have made extensive use of radio and television, both for direct class teaching and for school broadcasting, to reach more of their respective large populations. For these institutions, broadcasts are often accompanied by printed materials and audio cassettes.

Educational programming consists of a broad range of programme types—news programs, documentary programs, quiz shows, educational cartoons, etc.—that afford non-formal educational opportunities for all types of learners. In a sense, any radio or TV programming with informational and educational value can be considered under this type. Some notable examples that have a global reach are the United States-based television show Sesame Street, the all-information television channels National Geographic and Discovery, and the radio programme Voice of America. The Farm Radio Forum, which began in Canada in the 1940s and which has since served as a model for radio discussion programs worldwide, is another example of non-formal educational programming.

## **TELECONFERENCING AND ITS EDUCATIONAL USES**

Teleconferencing refers to –interactive electronic communication among people located at two or more different places. There are four types of teleconferencing based on the nature and extent of

interactivity and the sophistication of the technology: 1) audio conferencing; 2) audio-graphic conferencing, 3) videoconferencing; and 4) Web-based conferencing.

Audio conferencing involves the live (real-time) exchange of voice messages over a telephonenetwork. When low-bandwidth text and still images such as graphs, diagrams or pictures can also be exchanged along with voice messages, then this type of conferencing is called audio graphic. Non- moving visuals are added using a computer keyboard or by drawing/writing on a graphics tablet or whiteboard.

Videoconferencing allows the exchange not just of voice and graphics but also of moving images. Videoconferencing technology does not use telephone lines but either a satellite link or television network (broadcast/cable). Web-based conferencing, as the name implies, involves the transmission of text, and graphic, audio and visual media via the Internet; it requires the use of a computer with a browser and communication can be both synchronous and asynchronous.

Teleconferencing is used in both formal and non-formal learning contexts to facilitate teacher-learner and learner-learner discussions, as well as to access experts and other resource persons remotely. In open and distance learning, teleconferencing is a useful tool for providing direct instruction and learner support, minimizing learner isolation. For instance, an audio graphic teleconferencing networkbetween Tianjin Medical University in China and four outlying Tianjin municipalities was piloted in 1999 as part of a multi-year collaboration between Tianjin Medical University and the University Of Ottawa School Of Nursing funded by the Canadian International Development Agency. The audio- graphic teleconferencing network aims to provide continuing education and academic upgrading to nurses in parts of Tianjin municipality where access to nursing education has been extremely limited. Other higher education institutions using teleconferencing in their online learning programs include the Open University of the United Kingdom, Unitar (University Tun Abdul Ruzak) in Malaysia, Open University of Hong Kong, and Indira Gandhi National Open University.

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