

Technology And Instruction in Distance Education

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Introduction : Distance education was started in India in early 1960s in the form of correspondence courses. The instructional material brought out for the courses was printed matter. With technological developments, electronic media, radio and television became popular and these were added to the distance education programmes to make them effective and attractive. All these modes of distance education bridged the spatial distance between learners and teachers but teaching-learning process remained more or less passive. Distance learning programmes failed to provide appropriate learning environment and good two way communication between students and teachers and amongst students themselves. Practical limitation of the existing system of distance education is that a student at distance gets no opportunity to express his/her own ideas and get feedback as to how they compare with other people's ideas. The concept of teaching has now been changed, a teaching is not merely considered as transmission of information from teacher (source) to the learner (recipient). Effective education requires that learners interact with the peers and with teacher. Teacher should draw continuous feedback from student interaction. This feedback should be used to decide the direction of teaching learning process. Interaction is essential to make learners active partners in teaching learning process.

Applications of technology in teaching-learning process provides solution to all these problems. An isolated distance education student living in remote rural area, can now interact with other students and teachers through interactive television. A lonely learner can also interact with peers and teachers through e-mail messages. The dialogue among the students and between student and teacher connected by e-mail provides immediate support. Study groups can also be made more effective with the use of technology. For example, five/six students may gather around a computer. The computer programme can provide them with multiple kinds of data. Video-clips can be used for specific case study data. Students can then discuss all this informations and evolve their own concepts/explanations. Use of technology in distance education reduces the gap between rural and urban, priviledged and unpriviledged students. Students in all parts of the country can get benefit of best teachers and national experts. They can get the latest knowledge and developments at their own place. Learners can learn at their own pace, at their own convenient time. The paper is a humble attempt to describe how the technological development in India can be used to enhance interactivity, in distance education.

Satellite Based Interactive Learning

As you know that in India Radio and Television were introduced in distance education programmes at an early stage in 1960s. School radio broadcasts to supplement face to face school teaching were started as early as in 1950s. All these were one way communication systems.

Two-way communication became possible only in 1990s, when Indian Space Research Organization (ISRO) launched satellite INSAT 2-A and illustrated its' application for education. Now delivery of instructional materials can be made through satellite links. Learner can interact with teachers through Interactive Television or Teleconferencing mode. Teleconferencing and interactive television modes of interactive teaching are at experimentation stage in India.

Experts in the field of instructional technology are of the view that the satellite based interactive distance education requires transponder for uplinking, a teaching end studio and learning centres equipped with Direct Receiving Sets (DRS). ISRO has set up two earth stations, one at Space Applications Centre, Ahmedabad and other at Indira Gandhi National Open University, (IGNOU) New Delhi, with an extended C-band transponder for uplinking. This Training and Development Communication Channel (TDCC) developed by ISRO is jointly operated from SAC, Ahmedabad and IGNOU, New Delhi. These facilities can be used by different institutions. The Direct Reception facilities (known as nodes) exist at 200 centres in the country. These include all Regional Centres of IGNOU, a few study centres and various other user groups. Audio and Video signals from teaching end can be up-linked to INSAT 2-A satellite. The signals are down-linked from the satellite to a number of learning centres with the help of Direct Receiving Stations (DRS), located at learning centres. The return communication from learning ends (region centres and study centres) is via the STD telephone line. In addition, the return communication can also be sent via a fax line.

Tele-conferencing

Eradicating the monotony infusing active interactivity in distance education IGNOU, Initiative of the Government of India (GOI), UNESCO and National Open School (NOS), All India Management Association (AIMA), Indian Institute of Technology (IIT), Delhi, and Institute of Electronics and Telecommunication Engineers (IETE), Delhi have all pilot tested the feasibility of using teleconferencing for students, tutors, teachers, teacher educators, engineers and engineering teachers.

IGNOU and ISRO in 1993 used one-way video and two way audio satellite based talk back facility for Post Graduate Diploma in Higher Education. One way video

transmission and STD/FAX on return path for interaction was also used by IIT Delhi and IETE, Delhi for training of engineering teachers. NCERT in 1995 used teleconferencing for training of in-service teachers in an ongoing project called Special Orientation Programme for Teachers (SOPT). The experimental project Tele-SOPT was conducted in the states of Karnataka and Madhya Pradesh with the objective of pre-testing the effectiveness of interactive technology and to gain insight into the academic, managerial and technical aspects in the use of teleconferencing. In this project, the teaching end located at IGNOU campus was used, which consists of a studio with an uplink Transportable Remote Area Communication Terminal (TRACT). The studio has three telephone lines and also a line for fax to receive questions/responses from learning end. In this project, 65 learning centres were selected-45 in Madhya Pradesh and 20 in Karnataka. These learning centres were located at District Institutes of Education & Training (DIETs). DIETs provided room to accommodate about 40 learners and other basic facilities such as power, lightening etc. The learning centres were equipped with Direct Receiving Sets (DRS), which consists of Dish/Anntenna and Voice link (STD/FAX), TV sets.

At teaching end, the presentations were made either in the form of live lectures or through pre-recorded video tapes. Learners could interact with the teaching end by means of STD/FAX. These calls were received at the teaching end by EPABX. These questions were heard live at all the learning centres and teaching end. Learner's questions were answered by subject experts present at teaching end. At teaching end, the presentations were made either in the form of live lectures or through pre-recorded video-tapes. NCERT also used tele-conferencing for training of teacher educators. In District Primary Education Programme (DPEP) training of in-service teachers using tele-conference is a major intervention. In Tele-SOPT and DPEP learner's response was encouraging and satisfactory.

Interactive Television

Use of interactive television was pilot tested in the project 2000+ sponsored by Indo-US sub-commission in 1992. In this project, Class XII students of Kendriya Vidyalaya at Calcutta, Hyderabad, Madras, Ghaziabad and Bombay were taught selected topics in Science and Mathematics. Each learning centre was provided with one colour television, a computer six key pads and a telephone. The line telecasts were made from Central Institute of Education (CIET), Delhi. Uplinking and down linking was done using Doordarshan Channel. The key pads were used for student responses to teacher questions; computer provided on the spot feedback. Students asked questions on telephones.

Another pilot project, Inservice Primary Teachers Training–An Application of Interactive Television (IPTT : ITV) is an initiative of the Government of India (GOI), UNESCO and International Telecommunications Union (ITU). The project is being implemented in the states of Madhya Pradesh and Gujarat. It covers sixteen districts – 10 districts in Madhya Pradesh and 6 districts in Gujarat. There are twenty learning centres– 12 in Madhya Pradesh and 8 in Gujarat. The presentation centres are being developed at Bhopal and Gandhinagar. The digital uplinking facilities developed by Department of Telecommunication (DOT) will be used in this project. This project will pre-test the use of VSAT and ISDN delivery systems. Both these systems provide two-way audio and two-way video interaction.

VSAT Networking

Very small Aperture Terminal (VSAT) system uses digital compressed video. VSAT network can be integrated with the distance education system for carrying the return audio/data/video from the learning centre to the presentation centre. The audio/video/data signal received through VSAT at the teaching end is looped back normal TV audio/video network transmission and the learner at all learning centres can see the person on screen and hear the question being asked. This system provides two way audio and two-way video interaction between teaching and learning ends. If the channel allocated for training programme transmission and VSAT operation are on the same satellite, the same VSAT antenna can be used for reception of TV programmes. Both on-line and off-line interactions are possible through normal VSAT network. The same system can be used as Internet network for data communication as well as distance education requirements.

Telecommunications in Distance Education

Integrated Service Digital Network (ISDN) provides for transmission of voice, image and data over telephone lines. In this system the teaching and learning centres should have video conferencing system connected by DOTISDN lines. The ISDN line carries audio and video signals. The audio and video of a person who is asking question from learning centre are sent on ISDN line and received at teaching end. The video and audio output from a Desk Top Video Conferencing system is mixed with vision and audio mixer and looped back on normal TV transmission network so that everyone can hear the question and see the face of person also, who is asking questions.

Computer Designed Instruction : Various Open Universities and Directorates of Distance Education are exploring the possibilities of using computers in distance education programmes. Recent development in interactive multimedia computer applications provide for use of computer based interactivity in distance classrooms. Lecture outlines and course

content can be integrated with audio, video, film and slides to illustrate and explain the concepts, principles and models etc. Multimedia can be used to provide live example from different contexts. In teacher education, case studies can be very well illustrated using computer designed instructions. In multimedia instructional package, sample documents, audio interviews, video clips of classroom activities can also be included to provide a more realistic and interactive environment. Virtual educational setting can also be used for group learning or co-operative learning. The IPTT : ITV project will also experiment use of computer designed instructions and inter connectivity.

Computer Mediated Interactivity : Computer mediated communication systems such as e-mail and computer conferencing provide interactive environment for students, where students can interact with teachers and peers. Students can make entries of their field experiences and reflective thoughts in e-mail journal, which can be used to facilitate a more immediate interaction between students and teachers. Students when provided access to a computer with a communications programmes and modem can send their journal entries to teachers for comments and suggestions. Teachers can provide suggestions and comments to students. This immediacy of interaction facilitates the student's growth and develops the student's ability to think critically.

Computer Conferencing : Computer conferencing is another communication technology, which provides immediacy in interaction. Computer conferencing combines word processing and telecommunication via personal computers, telephone lines, and central computer conferencing systems. For computer conferencing, students computer are connected to one another and also to teacher. It helps students to compare their views with those of their peers. Computer networking can connect individuals around the world. Locating and exchanging information from world video sources is now possible. IPTT : ITV programme will also experiment this part of interactive technology. IPTT : ITV project uses Interactive Television in combination with print material and face to face teaching. This projects therefore, uses four kinds of interactivity viz ;

(1) face to face interaction, (2) Interactive television, (3) Inter connectivity
(4) Computer assisted interactivity.

Technology provides new and creative modes of interactivity in distance education. At the same time it provides us with the challenges of developing skills and knowledge required for application of these technologies.

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