

## **EDUSAT and its Utilisation**

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### **Introduction:**

Educational Technology (ET) is a systematic way of designing, implementing and evaluating the total process of learning and teaching in terms of specific objectives, based on research on human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction (Commission of Instructional Technology, USA).

Realising the importance of Media and Educational Technology in India, the National Policy on Education in its modified document-1992 (Media and Educational Technology, Para 8.10-11, Page 38) states that, “ Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and deprive sections of beneficiaries simultaneously with the area of comparative affluence and ready availability. Further it has stated that "Educational Technology will be employed in the spread of useful information, the training and retraining of teachers, to improve quality education, sharpen awareness of art and culture, inculcate abiding values etc., both in the formal and non-formal sectors. Maximum use will be made of the available infrastructure.

Today, our country engages nearly 55 lakhs teachers spread over around 10 lakhs schools to educate about 2,025 lakh children (Source: Chapter-I, NCF-2005, page 1). Also if we look at the data and analyse on the growth of teacher education organizations in the country, it reveals that the number of these institutions have been multiplied i.e. as on 31.03.2000 there were 2051 such organizations and as on 31.03.2005 the figure is 4550 (Source: NCTE-Annual Report, 2000 – 2001 and 2004-2005). Orientation of teachers and teacher educators of such a huge system at regular intervals is always a challenging task. Covering all such teacher educators only through face-to-face training and orientation programmes is virtually impossible. Organization of orientation programmes through a cascade model i.e. multi-tier training strategy (training of Key - Resource Persons, Master

Trainers etc. at State, District, Block and Cluster level) may be one of the modalities for training and re-training of a large number of teachers and teacher educators of our country. Special Orientation of Primary School Teachers (SOPT) and Programme for Mass Orientation of School Teachers (PMOST) was organized through adopting such strategy. However, keeping in view the transmission loss through such programmes (training through cascade model) and the resource crunch with the states, training of teachers through distance mode (video and audio conferencing) could be a better option.

In the recent years Media and Educational Technology are being employed to revitalise the entire education system all over the world. With Launching of a series of satellites by Indian Space Research Organisation (ISRO) broadcasting (audio and video) and teleconferencing facilities are now available in almost every states and UTs of our country.

The concept of beaming educational programmes through satellites was demonstrated for the first time in India through Satellite Instruction Television Experiment (SITE) in 1975-76 using American Application Technology Satellite (ATS-6). During this unique experiment, which is hailed as the largest sociological experiment conducted anywhere in the world programmes pertaining to health, hygiene and family planning were telecast directly to about 2400 Indian villages spread over six states. Later with commissioning of INSAT system in 1983 a variety of educational programmes is being telecast. In the 90s Jhabua Development Communication Project (JDPC) and Training Development Communication Channel (TDCC) further demonstrated the efficacy of tele-education. Even in the year 1996-97 under the tele-SOPT programme teachers of Madhya Pradesh and Karnataka were trained through video-conferencing. This has further established the importance of satellite communication in the field of education.

### **Launching of EDUSAT:**

Keeping in view usefulness of the INSAT in educational programmes MHRD visualized EDUSAT project in October 2002. The satellite was launched on 20 September 2004. EDUSAT is the first Indian satellite built exclusively for serving the educational sector offering an interactive satellite based distance education system for the country. It is specially configured for the audio-visual medium, employing digital interactive classroom and multimedia multicentric systems.

EDUSAT is primarily meant for providing connectivity to school, college and higher levels of education and also to support non-formal education including developmental communication. The scope of the EDUSAT programme is planned to be realised in three phases.

EDUSAT carries five Ku-band transponders providing spot beams, one Ku-band transponder providing a national beam and six Extended C-band transponders with national coverage beam. It will join the INSAT system that already has more than 130 transponders in C-band, Extended C-band and Ku-band providing a variety of telecommunication and television services. The EDUSAT offers opportunities for using satellite for human development in general and for education in particular. EDUSAT can be used for:

- Conventional Radio and Television broadcasting
- Interactive Radio and Television (phone-in, video on demand..)
- Exchange of data
- Video conferencing, Audio conferencing & Computer conferencing
- Web based education

### **Technological Possibilities**

#### **Figure-1**

**(to be added here from the attachments)**

### **Phases of EDUSAT operation:**

In the **first phase** of pilot projects, a Ku-band transponder on board INSAT-3R, which is already in orbit, is being used. In this phase, Visveswaraiah Technological University (VTU) in Karnataka, Y B Chavan State Open University in Maharashtra and the Rajiv Gandhi Technical University in Madhya Pradesh are covered.

In the **second phase**, EDUSAT spacecraft will be used in a semi-operational mode with at least one uplink in each of the five spot beams. About 100-200

classrooms will be connected in each beam. Coverage will be extended to two more states and one national institution.

In the **third phase**, EDUSAT network is expected to become fully operational ISRO will provide technical and managerial support in the replication of EDUSAT ground systems to manufacturers and service providers. Users are expected to provide funds for this. In this phase, ground infrastructure to meet the country's educational needs will be built and during this period, EDUSAT will be able to support about 25 to 30 uplinks and about 5000 remote terminals per uplink. Currently we are beginning the second phase.

Typically, two kinds of connectivity have been proposed. **Satellite Interactive Terminals (SIT)** and **Receive Only Terminals (ROT)**. The details are as follows:

- **SIT** with 1.2 meter antenna for low data rates (other equipment include a WLL connection a PC, a telephone and a television set) and is recommended for higher secondary schools and colleges. It can be used for TV broadcasting and data broadcasting.
- SIT for high data rates with an antenna of 1 .8 meter. It is considered suitable for direct interactivity over satellite channel for higher rates and for video conferencing and is capable of receiving TV and data broadcasting. Professional and university network can use this SIT with telephone and a **PC** for two way video and two way audio facilities.
- 0.7 meter Ku-Band TV antennas known as Receive Only Terminals (ROT) (these shall comprise of antenna, TV set and a PC). It can be used for TV and data reception by the schools as and when required.

Each of the National and Regional beams can be split into number of channels. The EDUSAT is designed to support about 72 channels, which are proposed to be distributed as follows:

- State channels 56 (28 for higher education and 28 for school education)
- 14 National channels each for various sectors: higher education, school education, technical education, adult education etc.

## **How EDUSAT network will operate?**

### **Figure-2**

**(to be added here from the attachments)**

## **EDUSAT network and CIET (NCERT)**

Central Institute of Educational Technology (CIET), NCERT has been utilising satellite technologies for about three decades. It has gained a wide range of experience in design and organisation of programmes using such technologies.

Some of these experiments are:

- Participation in Satellite Instructional Television Experiment (SITE) in 1975-76 in collaboration with ISRO
- Training of 48000 Science Teachers using multi-media programmes.
- Conduct of Classroom – 2000 Project in 1993 using technique of teleconference for direct teaching of Physics and Mathematics to the students at Senior Secondary level.
- Undertaking four experiments in the year 1996 and 1997 for the Orientation of Teachers under SOPT programme of MHRD and Hard Spots of Mathematics in the State of Karnataka and M.P.
- Telecast of video programmes on National Network of Doordarshan and the cable channel Gyan Darshan (February, 2000).
- The EDUSAT configuration has allowed CIET, NCERT to develop a network of institutions, together constituting a national network. This network facilitates an on demand two-way communication between institutions and within the schools of each institution. The school sector is to get a National Channel along with necessary uplink and down links. CIET (NCERT) has taken an initiative in this regard and entered into a MoU (Memorandum of Understanding) with ISRO for this purpose. A

Ku-Band Sub/Mini Hub has been installed at the CIET along with 100 terminals for installations at different locations in all the states and UTs

- The proposed school network could be used by various agencies for undertaking training programmes directly with the target groups as against the current approach of training master trainers, key resource persons and then reaching out to the target groups.

The various institutes of NCERT require distance mode of satellite education for conduct of training programmes, holding of virtual conferences, exchange of data and other services viz. linking of libraries and media resources of various Institutions.

### **EDUSAT network and its Utilisation by CIET, NCERT**

By using this network NCERT, so far has organized the following programmes for teachers and teacher educators of our country:

- Orientation of Teachers of KVs/ JNVs/ CBSE affiliated schools on new textbooks developed in the light of National Curriculum Framework-2005
- Orientation of Principals and Head Teachers of KVs on NCF-05 and primary level textbooks brought out in the light of NCF-2005
- Orientation of Fine Arts and Music Teachers
- Orientation of Teacher Educators of SCERTs, DIETs, CTEs and IASEs on NCF-2005
- Orientation of Teachers on Gender issues in Education
- Orientation of Teachers and Teacher Educators on New Trends in Evaluation
- Strengthening Guidance and Counselling: Orientation of State Level Key Personnel through Video Conferencing

In all about 100 days video conferencing was planned and organized by NCERT through EDUSAT network covering thousands of teachers and teacher educators of the country.

### **Conclusion:**

As India enters the new millennium, it is necessary to sustain such kind of effort by continuously tuning it to the fast changing requirement and updating the technology

that goes into the making of these sophisticated systems. The challenges continue to grow but that is what attracts and sustains the interests of personnel working in the space programme. Even if a satellite is launched, its meaningful utilization in any sector including education is a million dollar question and raises many eyebrows. The life span of EDUSAT, which was launched in September, 2004 is seven years and it has provided many facilities and possibilities. But the real challenge before us is how to feed this monster and reach out the rural masses especially millions of student's teachers and teacher educators in the country. For the successful use of this satellite a rigorous planning is need of the hour and collaborative efforts are essential for designing of the software and its utilization for achieving goals of education