

Use of Educational Satellite in Teacher Education

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Abstract

The universalization of education has become the top priority for developing country like India. The lack of adequate rural infrastructure and non-availability of good teachers in sufficient numbers is adversely affecting the teaching-learning process and hence the goal of quality education is far from reality. The teacher educators need to be trained professionally to face the situations in the classroom. Effective response to such a complicated challenge to educate millions with quality could be possible by satellite based ICT enabled education. ICT enabled educational delivery modes is possible only with right kind of satellite support. Thus the effort to change the national scenario in the area of education has already been initiated by (ISRO) by launching EDUSAT. The teacher training through distance mode is now an established system in India, especially after launching of dedicated satellite for education "EDUSAT". National and state level agencies have been organizing various training programs for teachers through EduSat. It has solved the problem of shortage of trained teachers, lack of quality teaching especially in the rural areas, teacher absenteeism, and uniform quality education. One must realize that to face such a complicated challenge the known traditional methods and conventional response will be far too inadequate. Thus the present article discusses the use of educational satellite (EDUSAT) for teacher orientation/ training in teacher education. This paper highlights about the EDUSAT, its uses, network configuration etc.. This paper is an attempt to describe the major programs conducted by CIET, NCERT through EDUSAT for orientation of teachers.

Keywords: EDUSAT, teleconferencing, video conferencing, orientation program, ICT, eacher education

Introduction

For any nation, the level and quality of education is one of the most important parameters for development. In India, the total literacy has gone up over the years but the quality needs tremendous improvement. The synergy between education and learning has to be well perceived and organized. The result of learning is the application of knowledge and skills by the individual for the benefit of the society, nation and the world. One of the serious problems associated with Indian school education has been high dropout rate. The reasons are many and varied but the major constraints are: non-availability of adequate number of competent and trained teachers in most of the schools and other institutions including teacher training institutions.

The Ministry of Education document "Challenge of Education: A Policy Perspective" (1985) has mentioned, "Teacher performance is the most crucial input in the field of education. Whatever policies may be laid down, in the ultimate analysis these have to be implemented by teachers as much through their personal example as through teaching learning processes." India has reached the threshold of the development of new technologies which are likely to revolutionize the classroom teaching. Unless teachers are capable and committed, the education system cannot become a suitable and potential instrument of national development.

India faces the challenge of regularly training a large number of teachers spread over vast geographical areas in different content areas and pedagogical aspects in the shortest possible time. It is not possible to cope with the numbers through institutional training alone. 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 programs is practically impossible.

The National Policy of Education – 1986 revised in 1992 recognized the need for improving in-service training; accordingly Program of Action of the policy emphasized the necessity for providing regular in-service training to school teachers. In this direction, a Program of Mass Orientation of School Teachers (PMOST) was formulated and organized between 1986 and 1989 with the collaboration of State Council of Educational Research and Training (SCERTs). In this program about 17.62 lakhs school teachers were trained and oriented specifically to the use of materials supplied under the Operation Black Board scheme. In addition to this a scheme called Special Orientation Program for Primary School Teachers (SOPT) launched during 1993-94 with a view to improve the quality of primary/elementary education as a part of the strategy of achieving Universalization of Elementary Education (UEE). The SOPT program was launched on a massive scale to cover 18 lakhs teachers at a rate of 4.5-lakh teachers, each year during the last 4 years of VIII Five Year Plan period. Special Orientation of Primary School Teachers (SOPT) and Program for Mass Orientation of School Teachers (PMOST) was organized through adopting such strategy.

In the implementation of this two schemes of teacher training certain deficiencies have been noticed. They are: non-availability of large number of equally competent resource person, transmission loss in imparting training through multi-tier training, inability to cover large number, spread over the vast regions and the quality dilution through such programs and the resource crunch with the states. To meet the twin challenges of reaching out to a large number of teachers with quality training, different educational agencies in the country have been organizing satellite-based interactive teacher training programs.

Teacher Training through Satellite Education (EDUSAT)

The extension of quality education to remote and rural region becomes a Herculean task for a large country like India with multilingual and multicultural population separated by vast geographical distances.

The shortage of trained teachers, lack of quality teaching especially in the rural areas, teacher absenteeism, need for uniform quality education, need for improvement in Science, Math's and English teaching requires to orient the teachers. One must realize that to face such a complicated challenge the known traditional methods and conventional response will be far too inadequate. Effective response to such a complicated challenge to educate millions with quality could be satellite based ICT enabled education. The clever and innovative integration of information communication technologies in an open and flexible academic structure would help India to address questions like increasing demand, quality and excellence and utility of higher education. There is a wide range of ICT enabled educational delivery modes. This includes, one way TV broadcast, Interactive TV via Phone in, Interactive TV with computer support through-mail, videoconferencing, Computer conferencing, telephone conferencing, Web-based instructions, etc.

Adoption of all these methodologies is possible only with right kind of satellite support. Satellite can establish the connectivity between urban educational institutions with adequate infrastructure imparting quality education and the large number of rural and semi-urban educational institutions that lack the necessary infrastructure. Besides supporting formal education, a satellite system can facilitate the dissemination of knowledge to the rural and remote population about important aspect like health, hygiene and personality development and professionals to update their base as well. Thus in spite of limited trained and skilled

teachers, the aspirations of the growing student population at all levels can be met through the concept of tele-education. Therefore, there was a growing demand for an interactive satellite based distance education system for the country.

In a university or college or a school, some have access to an excellent teacher of mathematics, but not in geography or English language and yet some in other institutions, reverse may be the case. For teaching say, mathematics, or Physics or history from the teaching end (uplink station), we need only about 10 excellent teachers who may be strewn around in various schools, colleges and universities. Such excellent teachers can be brought together to teach from the uplink stations, every learner then have access to the best of the teacher in the system. Also, student will have to access to interacting with such excellent teachers. Because of digital recording and possibility of retrieval, such lessons can be revisited again for reinforcement. Due to the launch of EduSat this things could be possible now a days. Thus the effort to change the national scenario in the area of education has already been initiated by (ISRO) through the launch of EDUSAT. Educating the nation in real sense may take long, but the process of imparting education/training could now be accelerated due to EduSat.

EDUSAT: An Introduction

With the success of the INSAT-based educational services, a need was felt to launch a satellite dedicated for educational service and ISRO conceived the EDUSAT project in October 2002. EDUSAT is the first exclusive satellite for serving the educational sector. It is specially configured to meet the growing demand for an interactive satellite-based distance education system for the country through audio-visual medium, employing Direct-to-Home (DTH) quality broadcast. The 1950 kg EDUSAT is launched from Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota, into a Geosynchronous Transfer Orbit (GTO) by ISRO's Geosynchronous Satellite Launch Vehicle (GSLV). From GTO, EduSat will reach the 36,000 km high Geostationary Orbit (GSO) by firing, in stages, it's on board Liquid Apogee Motor (LAM). In GSO, the satellite will be co-located with KALPANA-1 and INSAT-3C satellites at 74 deg East longitude. 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.

It is specially configured for the audio- visual medium, employing digital interactive classroom and multimedia multi centric 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.

EDUSAT objectives include

- Providing support to formal and non-formal education
- Teachers' training program
- Increasing access to quality resource persons,
- Enhancing community participation,
- Taking education to remotest corner of the country.

EDUSAT can be used for

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

Network Configuration of EDUSAT

Every state where EDUSAT project is implemented has a well-prepared studio for EduSat Interactive Network. In this entire network, this studio is called as teaching end. All other Satellite Interactive Terminals (SITs) spread over states is known as class ends. Network is a two way communication system, the subject experts or teachers who conduct classes from the teaching end can see and interact with the teacher/teacher educators or students who sit at each SITs. Teacher/teacher educators of each SITs can also see and hear Experts and ask their doubts or questions also through the same way. Even though the teacher and students are not within four walls of a classroom, they can interact with each other as they are in a same location. Network contains Personal Computers, Digital Cameras, DVD players, Switchers, Modems Dish antennas etc. At teaching end we have two PCs, Digital Camera, DVD player, Switcher, modem, sound systems, Dish Antenna etc. One PC is called Multimedia Server, which is loaded with a software call VLC. This software is used to control the transmission. Other PC is called presentation PC, which is used to present the notes, slides, prepared by subject experts. Digital Camera uses to get the image of teacher and can control remotely. A high quality DVD player is also included to show some recorded movies whenever necessary. The network is capable of data transfer from the teaching end to the remote classrooms. The data includes lecture notes, courseware, presentation material, exercises etc. Thus

EDUSAT is a technology network comprising

- Uplink stations in selected nationals and state locations (to act as teaching end)
- Downlink stations or facilities in various educational institutions(as learning ends) and
- The satellite

EDUSAT world's first satellite meant only for educational purposes, is being used. Training by teleconferencing overcomes the problem of transmission loss since participants are watching, listening and interacting with the primary resource persons. CIET a constitute unit of NCERT using this technology of teleconferencing over a decades to give training/ orientation to teacher and teacher educators. Other institutions like IGNOU, Vigyan Prasar, Sarva Shiksha Abhiyan (SSA), Rehabilitation Council of India (RCI), and National Trust are regularly using tele-training methodology for implementation of their all India level schemes and projects.

CIET, NCERT has been utilizing satellite technologies for about three decades. It has gained a wide range of experience in designing and organization of programs using such technologies. 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.

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 programs 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.

EDUSAT Network and its Utilization by CIET, NCERT

Central Institute of Educational Technology (CIET), NCERT has been utilizing satellite technologies for about three decades. It has gained a wide range of experience in designing and organization of program using such technologies.

By using this network NCERT, so far has organized the following program 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

The program was organized from 9 July to 20 August, 2006 (for 36 days) covering 25 SITs in different states involving 12000 teachers and a sum of Rs. 25,00,000 (twenty five lakhs) was spent. The new textbooks developed by NCERT during the first phase:: (Classes I, III, VI, IX and XI) in the light of NCF-2005 was discussed with the teachers. Similarly, after completion of the textbook -development process for the second phase, i.e. Classes II, IV, VII, X and XII, once again the NCERT organized the video Conferencing for 36 days during the month of June-July, 2007 and interacted with the teachers on the new textbooks.

- Orientation of Principals and Head Teachers of KVs on NCF-05 and primary level textbooks brought out in the light of NCF-2005

The program was organized on 19 September, 2006 covering 17 SITs in different states involving 500 teachers and a sum of Rs. 1,00,000 (one lakhs) was spent.

• Orientation of Fine Arts and Music Teachers

The program was organized on 21 September, 2006 covering 15 SITs in 15 states! UTs involving 600 teachers and a sum of Rs. 54,000 (fifty four thousand) was spent. The vision articulated in the NCF-2005 and the National Focus Group position paper on Arts, Music, Dance and Theatre was discussed during this program.

• Orientation of Teacher Educators of SCERTs, DIETs, CTEs and IASEs on NCF-2005

Curriculum group of the NCERT organized an orientation program on NCF-2005 for teacher educators through EDUSAT network from January 18 to February 09, 2007. Approximately 4,000-- elementary and secondary level teacher educators from Andhra Pradesh, Chandigarh, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Tamil Nadu, Uttarakhand and West Bengal participated in the program. The main approach was to cover all the faculty members within an institution through two-way video conferencing.

• **Orientation of Teachers on Gender issues in Education**

The Department of Women's Studies, NCERT conducted a three days video conferencing on 28 and 30 January and 1 February, 2008 and discussed various issues related to gender concerns as envisioned by the National Focus Group position paper on Gender Issues in Education, NCF-2005 and the new syllabi and textbooks. Experts from various NCERT constituents provided resource support and interacted with the participants at 26 centers spread across 22 states and union territories.

• **Orientation of Teachers and Teacher Educators on New Trends in Evaluation**

The CIET, NCERT organized a half day orientation program on New Trends in Evaluation on 29 January 2008. Teacher educators of various states/union territories participated in the program and interacted with the resource persons on the theme like e-portfolio and evaluation rubrics.

• **Workshop on Research Methodology for ICT in Education from 11-13 August, 2009**

A three day workshop was organized in order to explore the research methodologies for the ICTs in education. This workshop was organized through INSAT during Aug 11-13, 2009 at CIET. The target group of this workshop was teachers and teacher educators. 200 teacher educators participated in this workshop. The teacher educators were seated at 10 selected Satellite Interactive Terminals (SITs) at the SIETs, SCERTs and SIEs (20 Participants approximately from each center). The purpose of this program was to create awareness about various research methodologies suitable for ICTs in education.

- Issues and concerns of special education groups having specific needs as reflected in NCF-2005 and National Focus Group reports.

To orient the teacher educators on the various issues and concerns related to the inclusive education of the children with disabilities and children from SC, ST and Minorities, as reflected in NCF 2005 a three day workshop was organized from 14-16 Sep, 2009 at CIET by the department of group of special needs.

• **Workshop on Research Methodology for ICT in Education**

Another three day workshop was organized in order to explore the research methodologies for the ICTs in education. This workshop was organized through INSAT during Oct. 5-7, 2009 at CIET. The target group of this workshop was teachers and teacher educators. In total there were 160 participants and the teacher educators were seated at 12 selected Satellite Interactive Terminals (SITs) at the SIETs, SCERTs and SIEs. The purpose of this program was to create awareness about various research methodologies suitable for ICTs in education, to help participants to develop a research proposals (draft) for any one area from ICT in education, by selecting appropriate research methodology and to help participants assess the research proposals developed for ICT in education.

• **Training Program for Primary School Teachers on Puppets in Education**

The three day workshop on puppets in Education was organized through distance mode using EDUSAT network. Demonstration model schools of Regional institute of Education NCERT DMS, was identified as learning centers. Objectives of the training program were: to promote the use of puppets in teaching learning in schools, to use locally available materials in puppet making, to develop scripts, puppets and manipulation skills through participants activity

- **Workshop on Research Methodology for ICT in Education**

A three day workshop on Research Methodology for ICT in Education was organized for 13th January 2010 to 15th January 2010. This workshop was attended by 260 teacher educators from 13 selected satellite interactive terminals located in 12 states.

The objectives of this workshop was to create awareness about various research methodologies suitable for ICTs in education and to help participants develop a research proposal for any one area from ICT in Education by Selecting appropriate research methodologies, to help participants assess the research proposal developed for ICTs in Education.

- **Teleconferencing Program on Mathematics for TGTs and primary school teachers of Hindi speaking region**

A three day workshop on mathematics for trained graduate teachers for Hindi speaking region was organized from 10th to 12th February 2010 and dated 17-19th February, 2010. The purpose of this was to orient trained graduate teachers in Mathematics on basis of NCF.

- **Teleconferencing Program on Mathematics for TGTs of non Hindi speaking regions**

Another three day workshop was organized for trained graduate teachers of mathematics of non-Hindi speaking region from dated 24-26th February, 2010.

- **Orientation-cum-workshop on Action Research in Educational Technology**

In order to expose the participants in Action Research, a four day workshop is planned for the teacher educators through EDUSAT between January 27th 30th, 2011. This workshop was attended by 200 teacher educators of SIETs/SCERTS from 6 different states.

Conclusion

Recognizing the importance of Teacher Training Institutes and the crucial role of teachers in bringing in an awakening and skill development among the target groups (students, community leaders and school teachers), it was decided to put EDUSAT to use in different spheres of Teacher Education. It is expected to be put to use to enhance the communication and presentation skills of the teachers, to motivate them through dissemination of Best Practices in the field, make available research material online and finally create an IT culture across the nation by introducing and developing IT literacy course for the teachers. With large number of stakeholders involved, it will be a major challenge to make the operation of networks smooth and effective. While a lot of ground work is required for effective implementation of the slated plans and activities as of now the project implementation units are working on issues such as capacity Building of the Users, Content Generation, defining a management structure which could take on the overall responsibility of operation and management of the network and the hubs and evolving a ongoing feedback and monitoring mechanism. The real challenge is the need to put technology – both space and ground segment, infrastructure, operations and maintenance systems, creative content generation, target group networking and professional management together (Hansa Joshi and Madhavi Purohit , 2004). Since life span of EDUSAT satellite is almost 10 years, So there is more need to launch more satellites which serve the in the field of education. Teleconferencing through EDUSAT to be effective for any type and purpose would require planning; teaching strategy, development of content and materials, presentation techniques and evaluation etc. It will require a massive effort on the part of all educators.

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