



Commonwealth Educational Media Centre for Asia



Teleconference Based model of Capacity Building for ICT Integration



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Summary

Information and Communication Technology (ICT) has brought proliferation of innovative means for professional development of teachers. This article describes the use of teleconferencing and video conferencing models in professional development of teachers. These modes of in-service education of teachers have successfully been able to overcome the issues of access, quality and transmission loss with which the conventional professional development models suffer. EDUSAT is being used effectively and successfully used for training of teachers under the centrally sponsored of Sarva Shiksha Abhiyan (SSA). It has addressed the challenges of providing quality training to the millions of teachers of the country especially in rural, hilly and remote areas where conventional system could not reach effectively. Presently 24 states of the country are using the EDUSAT facilities that have revolutionized the system of education in the country. Use of ICT for capacity development is a viable alternative to face-to face model if exploited effectively.

Editor's Note

Teacher Educators need to visualise ICT integration in a holistic manner and the author in this paper describes the use of tele-conferencing and video-conferencing models in professional development of teachers. These modes brought proliferation of innovative means for professional development of teachers. Author also explains that, how EDUSAT is used effectively and successfully for training of in-service teachers has successfully able to overcome the issues of access, quality and transmission loss under Sarve Shiksha Abhiyan (SSA) in India with which the conventional professional development models suffer. It addresses the challenges of providing quality training to the millions of teachers of the country especially in rural, hilly and remote areas where conventional systems could not reached effectively. Teacher educators are therefore urged to think about their own context, and go beyond to use of ICT for capacity building is a viable alternative to face-to-face model if explored effectively.

The context

Teaching is a creative and individualistic process that requires rejuvenation of teachers' knowledge and competencies on a continuous basis as the impact of pre-service education cannot be sustained over a period of time due to the fast pace of changes in the knowledge

and information sector and consequent demands on teachers. Teachers like other professionals are expected to continuously update their knowledge and pedagogical skills to contribute meaningfully in the development of human resources of the country. India has a large number of teachers employed in the education sector who need continuous orientation and up gradation of their skills and competencies. According to the Eight All India Educational Survey (2009) 6,051,639 teachers are employed in the school education sector of the country that requires recurrent professional development. Equally, large numbers of teaching professionals are working at the higher education sector. Addressing the continuous professional development needs of such a large population means that institutions responsible for their in-service education are well equipped with adequate infrastructural facilities and human resources to address the needs. However, experiences in the area of in-service teacher education in the country reveal the inadequacy of both these resources to meet the policy mandate of professional development of teachers once in five years. If we take into account the number of the existing teacher education institutions mandated to provide in-service training to teachers in comparison with the number of teachers in need of such training programmes, through the traditional face to face training programmes, the enormity of problem and difficulty of meeting the NPE (1986) mandate of providing in-service training to teachers once in five years can be understood. Limited number of 571

DIETs, 31 IASEs, 109 CTEs and 37 SCERTs cannot cope with the burden of providing in-service training to more than 7lakh teachers employed in the school education sector. Similar concern has been expressed by Pandey (1999). Even if the in-service training programmes are organized in a mass level, such as, in the case of centrally sponsored schemes of the Programme of Mass orientation of School Teachers (PMOST), and Special Orientation of Primary Teachers (SOPT), it takes years to achieve the target population. In addition, the face to face model of in-service education of teachers (INSET) generally follows the multilayered cascade model of training that affects the quality of training from one layer of hierarchy to another due to transmission loss. Further, India faces the challenge of providing recurrent training to a large number of teachers scattered in rural and remote areas where it is difficult to reach, there are also problems such as shortage of science and mathematics teachers, and those in the system lacking the necessary competencies and skills. We also have huge number of teacher educators and other functionaries employed in the education sector requiring recurrent training. It is extremely difficult to meet the in-service requirements of all these groups through the existing institutional network in traditional face-to-face mode.

Considering the limitation of tradition model of teacher training and its trickledown effect for professional development of teachers, that may take years to cover the target groups, technology based models provide effective alternative options and have the capacity to overcome the limitations of traditional model of teacher training. The advent of Information and Communication Technology (ICT) in education has resulted in proliferation of a number of technology based models of education and training. Teleconferencing is one such model that promises an effective means for providing equal quality of training to a large number of teachers together. It is also possible to utilize state-of art ICT facility in an interactive mode. It can be facilitated by immediate interaction through two way communication between the teaching and the receiving ends as well as through fax, STD, emails etc.

Teleconferencing based model for capacity building of teachers

Distance education has established its relevance and efficiency across the globe and considered as having immense potentials for continuous professional

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development of teachers. By infusing various technologies in teacher training process teachers' professional learning can truly be made a career long process. There are numerous instances of ICT being used as an intervention strategy in professional development enabling teachers to take responsibility for their own learning. Use of ICT for professional development of teachers provides the flexibility necessary for successful delivery of education. Delors report (1996) and UNESCO World Education Report, *Teachers and Teaching in a Changing World* (UNESCO,1998) recognized the potentials of distance education technology for in-service education of teachers and considered it as a more economical and effective means of implementing reforms or introducing new technologies or methods. The technology based models are being widely used by both developed and developing countries for in-service teacher education programme. Indonesia, Brazil, Pakistan, Latin America, USA, Australia, UK, Nepal, Sri Lanka, Bangladesh and China etc. have been using distance technology successfully.

The UNESCO report entitled *Information and Communication Technologies in Teacher Education: A Planning Guide* (2002) identifies the importance of ICT for teacher education as “teacher education institutions may either assume the leadership role in the transformation of education or be left behind in the swirl of rapid technological changes. For education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies.” (p.13). Needless to say that there is growing pressure on teacher education institutions to prepare teachers who are confident and competent in using ICT in their personal and professional lives; that is ‘students should learn about, learn with, and learn to incorporate technology into their own teaching, (SITE,2002).

The importance of ICT for education and teacher education has also been recognised and well-articulated in all the national policies and programmes initiated in the country. The National Curriculum Framework for School Education, 2005 and subsequently, the

teacher education curriculum frameworks of 1998 and 2009 articulated the need of integrating ICT in teacher education programmes, both at pre-service and in-service stages. The National Focus Group on Educational Technology (2006) suggested that the pre-service teacher education programmes should incorporate the *'use of media and technology enabled methods of learning, making them inherent and embedded in the teaching learning process.'*(p.15). It further suggested ICT literacy for not only for teachers but also for educational leaders, head masters and principals etc.

The Information and Communication Technology (ICT) and its use for the purpose of education and training has undergone significant change from the launch of the first multipurpose geo-stationary satellite INSAT 2A (1992) utilising the Transportable Remote Area Communication Terminal (TRACT) to EDUSAT (2004) with state of art technology.

The report of the National Knowledge Commission (2008) has given significant importance to ICT in education and recommended that 'wherever feasible ICT should be made more accessible to teachers, students, and administration of learning, training, research, administration, management, monitoring etc. This requires the provision of more facilities such as computers as well as connectivity and broad band facilities. Computer based leaning also requires training of teachers and other staff in order to make the best use of technology.'(p24). Expressing its concern over the quality of both pre-service and in-service teacher training programmes, the Commission expressed the need to improve the quality of both levels of teacher training programmes by adopting greater flexibility in teacher training modalities by incorporating ICT fully in teacher training programmes, which in turn will lead to more frequent use of ICT in classroom. Therefore, 'ICT should be made more accessible to teachers, students, and administrators for learning, training, research, administration, management and administration etc. This requires the provision of more facilities such as computers and broadband facilities. Computer aided learning also requires training of teachers and other staff in order to make best use of technology' (p.42). It has further recommended establishment of a web based portal for teachers to exchange ideas information and experiences. Verma

Committee report (2012) has also visualized a greater role for distance education techniques in the continuous professional development of teachers.

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Use of Teleconferencing for Special Orientation of Primary Teachers (SPOT) by National Council of Educational Research and Training (NCERT)

The National Council of Educational Research and Training (NCERT) made a pioneering effort to utilise

teleconferencing for use of ICT in capacity building of teachers. The National Council of Educational Research and Training, NCERT in 1993-94 significantly integrated multimedia technologies in two major centrally sponsored in-service teacher training programmes-Primary Mass Orientation of School Teachers (PMOST) and Special Orientation of School Teachers (SOPT).

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The experiment first began in 1996 through one way video and two way audio teleconferencing programme for training of primary teachers under the Centrally Sponsored Scheme of in-service training of primary teachers known as 'Special Orientation Programme for Primary Teachers (SPOT). It has been further extended to two ways audio and two way video teleconference programme with the onset of 21st century by NCERT. After the implementation of National Curriculum Framework (2005) for School Education, NCERT has extensively used the video-conferencing facilities to orient teachers, working at various stage of school education on NCF2005.

The one way video and two way audio programme of NCERT for training of primary teachers called as 'Tele SOPT' was initiated on experimental basis in 1996. Two such training programmes, having seven days duration each were organised for primary teachers of the states of Karnataka and Madhya Pradesh in 1996 and 1997 respectively. In 'Tele SOPT' Karnataka, 850 teachers assembled at 20 identified training centres in the state were provided training. The programme organised for primary teachers of Madhya Pradesh covered a much larger number of 1400 primary teachers through 45 learning centres of Madhya Pradesh. Similarly, 700 primary teachers of Karnataka (1997) were provided training in teaching of mathematics through 20 identified learning centres in the state, by NCERT through its 'Tele Maths' programme. All these programmes had been quite successful and the teleconferencing programme was further extended to the in- service training of teacher educators of District Institute of Education and Training (DIETs) of Madhya

Pradesh. The evaluation of these programmes (Phalachandra (1997), Pandey (1999), Putela (1998), etc.) reveal the success of teleconferencing as a means for capacity building of a large number of teachers simultaneously ensuring equal quality of training to thousands of teachers through a single programme that is not possible with the conventional cascade model of training which suffers from serious quality concerns in terms of training inputs provided by different resource persons at different levels of training. Teleconferencing provides opportunity to a teacher sitting in the extreme corner of the country to watch and interact with resource persons.

Teleconferencing for capacity building of Teachers under DPEP and SSA

Another significant attempt has been made in the use teleconferencing for training to teachers under the District Primary Education Programme (DPEP), a comprehensive national programme aimed at attaining Universalisation of Elementary Education (UEE) through the District Primary Education Project-Distance Education Programme (DEPE-DEP) located at Indira Gandhi National Open University (IGNOU). Utilising a thoughtful combination of teleconferencing with media and face to face components, this programme successfully reached out to more than 23000 primary teachers, teacher educators and other functionaries associated with primary education in 18 states of the country. A total of 112 teleconferencing programmes were organised at the national and state levels (DEP-DPEP, 2003). It is pertinent to note that teleconferencing has frequently been used under the DEP-DPEP programme by IGNOU, as well as various states to provide training to teachers, and coordinators of Block Resource Centre (BRC) and Cluster Resource Centres (CRC) during the entire period of the operation of DPEP programme.

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Later on, the Government of India launched its flagship Scheme the Sarva Shiksha Abhiyan (SSA) for Universalization of Elementary Education in mission mode in 2001, merging various schemes of UEE including the DPEP. One of the focus areas of SSA has been capacity development of teachers at district, state and national levels as a means to address the quality concerns at the elementary level. The Distance Education Programme (DEP) had been accepted as the national component within Sarva Shiksha Abhiyan (SSA) by MHRD, government of India in collaboration with IGNOU as the nodal institution in 2003 in all the 35 states and Union Territories of the country. The main objective of DEP-SSA has been to evolve a sustainable training system for elementary school teachers and functionaries through open and distance education inputs like developing high quality training materials (print, audio video, multimedia packages) work place based training inputs and training in content generation for ICT inputs (Jena et.al, 2009). The DEP-SSA, IGNOU has used teleconferencing programmes in large scales for providing cost effective training to various functionaries under SSA in addition to the elementary teachers since during the period of its operation from 2003 to 2013. Therefore, teachers across the country had the opportunity to interact with national level resource persons directly through the teleconferencing and get equality quality of training. Thus DEP- SSA has empowered teachers and other functionaries for effective transaction of curriculum at the elementary level.

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The SSA supports EDUSAT initiatives in states like Madhya Pradesh, Chhattisgarh, Bihar, Uttar Pradesh, Tamil Nadu, Karnataka, and Haryana, and Andhra Pradesh, etc. Karnataka was one of the earliest states to use teleconferencing model for in-service training of its primary teachers under SOPT programme, and has extended it further over the years. The EDUSAT programme of Karnataka was launched in 2004-05 in collaboration with ISRO and government of Karnataka

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and is operational in approximately 885 elementary schools in Chamarajanagar, 885 elementary schools in Gulbarga, 406 elementary schools in Bangalore Rural, and 427 elementary schools in Ramanagar covering 3,90,000 children, 13000 teachers and 2000 educational functionaries. Under the SSA Scheme it has been equipped with Receive Only Terminal (ROT)- a solar power pack including one 29" colour TV with local TV box, UPS and batteries in all schools. 229 ROTs have been provided to all the offices of Deputy Directors of Public Instructions (DDPI), DIETs and Block Resource Centres in Karnataka. The state has organised various teleconferencing programmes and provided in-service training to teachers in very large numbers. For instance, about 45000 -55000 primary teachers teaching English language from classes I-IV were provided training through five teleconferencing programmes. In the year 2008-2009 five teleconference programmes were organised to orient about 1,20,000 teachers across the state, including teachers from aided schools (Kumara, S. 2009). The states of Madhya Pradesh and Gujarat have also utilised the teleconference based in-service teacher training programmes successfully to provide training to teachers on a mass scale. Madhya Pradesh and Chhattisgarh have also organised a number of training programmes for functionaries of Panchayat Raj institutions through the teleconferencing. SSA has been using the teleconferencing facility for training of teachers under four broad themes: building awareness, contextual issues, curricular areas and state specific needs. A number of issues find place in these training programmes such as alternative schooling, academic support to BRCCs and CRCCs, training of VECs, gender issues, education of disabled children, teaching of hard spots, subject specific training, and use of teaching -learning materials, etc.

Gujarat, under the distance education programme of SSA, made extensive use of teleconferencing for state-wide capacity development of various functionaries including the school teachers. Moving a step further, the state government of Punjab set up a registered 'Punjab EDUSAT Society' in 2007 and has also been

organising training of teachers through teleconferencing using the EDUSAT facilities since 2005.

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NUEPA has been using two ways audio and one way video teleconferencing technology for orientation of field level functionaries working as respondents of District Information System of Education (DISE). In order to avoid any kind of error that could be committed at the stage of filling the DISE DCF and data entry continuous monitoring, verification and training is necessary. The number of field level functionaries working as respondents to the DISE DCF are too large and scattered over the country and adopting the conventional cascade model of training is not only time consuming but may also result in loss of information. Teleconferencing, in this context was visualised to be more suitable and has been used since 2008-09 to orient large number of respondents. NUEPA has used the studios of Educational Media Production Centre (EMPC) of IGNOU for training of these functionaries. In collaboration with IGNOU NUEPA has covered all the states and union territories for training the respondents.

A number of Organisations such as Rehabilitation Council of India (RCI) and National Trust, State Bank of India, IITs, DST/ National Council of Science Museum, and National, Institutes of Electronics and Tele-communication Engineers, and Productivity Council etc. have also found teleconferencing as a cost effective methodology, training their staff at a mass level.

From Teleconferencing to Video Conferencing

With the advancement of technology, the teacher training programmes using ICT have also witnessed a change from teleconferencing to video conferencing. A video conference (also known as tele videoconference) is a set of technologies which allows two or more locations to interact via two way audio and video transmissions simultaneously. (<http://en.wikipedia.org/>

wiki/Videoconferencing). Teleconferencing has the limitation that the person at the learning end has the facility of two- way interaction, but those at the teaching end have only one way interaction as they cannot see the learners at the other end. Video-conferencing has provided the opportunity to both teachers and learners to see and interact with each other in real time in spite of physically located at a distance. Thus, the barrier of geographical distance has been removed by the videoconferencing facility.

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The EDUSAT configuration has allowed the educational institutions like 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. 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. This network is being used for undertaking training programmes directly with the target groups as against the conventional approach of training master trainers, key resource persons and then reaching out to the target groups.

NCERT and its Regional Institutes have been using videoconferencing for organisation of training programmes, holding of virtual conferences, exchange of data and other services viz. linking of libraries and media resources of various Institutions. Through videoconferencing network, NCERT has been organizing several programmes for teachers and teacher educators of the country. Most significant among these are orientation of teachers of Kendriya Vidyalayas, Navodaya Vidyalayas and schools affiliated to the CBSE Board on the textbooks developed on the basis of National Curriculum Framework (NCF, 2005), Orientation of principals and Head Teachers of KVs on NCF, 2005; orientation of teacher educators of DIETs, SCERTs, CTEs and IASEs on NCF 2005,

During these orientation programmes the participants got opportunity to put forward their reflections, views, observations, suggestions and also questions/queries on different aspects of curriculum framework, syllabi, textbooks and practical aspects related to transaction of the curriculum to satisfy their curiosity and clarify their concepts.

orientation of teachers on gender issues, orientation of teachers and teacher educators on new trends in evaluation and a number of subject specific training programmes, etc. Therefore, for the first time teachers from different parts of the country interacted directly with the textbook writers/developers, experts in different subject areas, and the policy planners concerned with curriculum, syllabi and the textbooks. During these orientation programmes the participants got opportunity to put forward their reflections, views, observations, suggestions and also questions/queries on different aspects of curriculum framework, syllabi, textbooks and practical aspects related to transaction of the curriculum to satisfy their curiosity and clarify their concepts. Expert panelists provided answers to their questions/queries within the time available to them. These programmes provided new experiences covering important aspects of NCF-2005, syllabi, textbooks and other related aspects with large but structured participation of experts and teachers.

Challenges in using interactive technology for teacher training

Use of teleconferencing and videoconferencing as means for capacity building of teachers has revolutionized the process of continuous professional development of teachers. Use of teleconferencing and video conferencing has ensured access to equal quality of training and teaching inputs for each and every one participating in the programme rendering remoteness of geographical locations meaningless. However, the efficiency and effectiveness of teleconferencing are linked with the way the content is organized and presented, the efficiency of the resource persons, appropriateness of activities for achieving the objectives, and implementation of strategies that increase interaction and participation, etc. (Rao & Khan, 1998; Khan, 2000; Trivedi, 2004; Balaouras, 2008; Agorogianni, Zaharis & Goudos, 2008; Kalogiannakis & Vasilakis, 2008). The issues of emulating a conventional classroom through in a teleconferencing programme, lack of opportunity for interaction due to increase in the number of learners/participants at the learning end and technical issues such as quality of reception of picture and sound, constant power failure, disturbance in telephone lines and non-functioning or non-availability of telephone lines or fax facilities need to be addressed to improve the quality of ICT based teacher education programme for capacity development of teachers.

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