

# Information and Communication Technology and Distance Adult Literacy Education in India

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**Abstract:** *With new technological developments, new communication technologies such as satellite television broadcasting, long-distance telephony, computers and telecommunications, have sparked of optimism about their potential to harness educational development in India. With the convergence of satellite technology with the new information technologies at the global level, information and communication technologies have assumed new meaning and relevance for distance education and training. The hallmark of new technology is its distributive power and its ability to reach a large number of learners in dispersed locations. However, discussions and debates on implications of new communication technologies for distance education and training have focused primarily on school education and higher education. This paper highlights neglect of promoting adult literacy education through open and distance education and examines some of the recent experiments in using radio, television, and computers for imparting literacy in India. The question is not about using new information and communication technologies (ICTs) for adult learning, but about how the ICTs can be used for imparting basic literacy skills to the vast population of illiterate and semi-literate adult learners, whose learning needs are not yet addressed by the existing system of distance education in India.*

## Introduction

In the context of global economy and competitive markets, knowledge is a key factor contributing to economic development. Therefore, human resource development through education and training has become a key component within the overall strategy for economic restructuring in developing countries. The future of global economy and democratic polity in the twenty-first century is likely to depend on skilled and educated workers and enlightened citizens. It was the World Conference on Education for All, held in Jomtien (Thailand) in 1990 that highlighted the critical importance of addressing the learning needs of all children, youth and adults, who have been excluded and unreached by the existing system of formal and nonformal education, and contributed to building global consensus around the goals of Education for All (EFA). In the context of globalization, basic learning skills and competencies are necessary not only for children, but also for unschooled and illiterate youth and adults, who are valuable human resources of every society.

The new technological developments in information and communication technologies (ICTs), such as satellite radio and television broadcasting, long-distance telephony, computers and telecommunications, have dramatically expanded our options for engaging in learning and teaching at the individual, community, and societal levels.

The hallmark of ICTs is their distributive power and their ability to reach a large number of learners in the dispersed locations. To meet new educational challenges in the present times, the use of ICTs in distance education and training is indispensable. The question is not about the role of ICTs in open and distance learning, but about how the ICTs can be used for making basic education, skills and knowledge available to those who are unreached by the existing system of education.

With the phenomenal expansion of the formal educational system in India since Independence, there has been a perceptible improvement in the literacy situation of the population above the age of 7 years for both the sexes. The literacy rate increased from 18.3 percent in 1951 to 65.4 percent in 2001 (Bose:2001:34). However, progress of literacy has remained uneven across regions, gender and communities. The challenge of literacy becomes visible when we examine the magnitude of illiteracy among different populations in the absolute sense. The absolute numbers of illiterates have declined the first time since Independence from 328.17 million in 1991 to 296.21 million in 2001. However, the challenge of making India literate in the twenty-first century is very daunting. India still has the largest number of illiterates in the world, about one-third of the world's non-literate population of about 900 million. In the context of widespread illiteracy in India, to what extent these new technological possibilities in open and distance education have been explored to impart basic literacy education to a large population of illiterate youth and adults?

Discussion in this paper is organized in four sections. The first section draws attention to general neglect of ICT-based adult literacy education in the distance education system in developing countries including India. Recent experiments in using radio, television and computers for imparting literacy to the adult learners in India are critically examined in the second section. The final section highlights salient issues pertaining to use of ICTs for adult literacy education in the Indian context.

### **Marginality of adult literacy education in distance education system**

To what extent open and distance education is used on its own and in combination with conventional methods to meet the EFA goal of "meeting basic learning needs" of adult learners who have remained illiterate? Given the limitations of conventional methods to reach the millions of children, youth, and adults in developing countries, distance education has been identified as an important modality to extend educational opportunities to the marginalized groups. However, alternative ways of providing basic education and nonformal education are not yet explored (Edirisingha, 1999; Dodd, 1996). Although open and distance education was first used at the school level, all around the world it has flourished in higher education. Even when it is used at the school level, it is restricted primarily to secondary and higher secondary education (Mukhopadhyay and Philips, 1994). Given the limited reading skills of students in the early grades and the need for greater attention and direct contact with the teachers, potential of using open and distance education for promoting literacy among the vast population of adult illiterates or neoliterates is not yet explored in developing countries (Mukhopadhyay 1997:3-5). There is very little evidence of using distance education at the basic education level, leave alone for the illiterates and neoliterates.

Against the background of marginality of adult literacy education in open and distance education, ICTs are also not used extensively for imparting literacy skills to adult learners in developing countries. Radio and television have been widely used to disseminate development information to large audiences in rural and urban areas. However, use of broadcast media for teaching literacy has remained very limited (Maddison, 1974; Burke 1976, McAnany and Mayo, 1980). There is very limited research on the use of ICTs to impart basic literacy skills and post-literacy education. Appropriateness and effectiveness of various communication channels for specific content and instructional methods of literacy learning and training is also not systematically examined. Thus, distance education system in developing countries has not been yet geared towards meeting the new challenges of providing basic literacy education to adults from disadvantaged sections of society with varying learning needs. It is against the general context of marginality of distance literacy education in developing countries that we will examine sporadic efforts made to teach literacy through radio, television and information technology in India.

### *The Indian situation*

In India, adult education programmes have depended primarily on printed instructional material for imparting literacy. Before the introduction of nationwide programmes of adult education in the late 1970s, hardly any attention was paid to using appropriate education technology for developing relevant content and pedagogy for literacy teaching and learning. Sporadic efforts were made to use radio and television for imparting useful knowledge and information to the intended audiences in organized learning situations (Patel, 1993). For example, the *Radio Farm Forum* in the 1950s (Mathur and Neurath, 1959), and Rural Agricultural Television Project, known as *Krishi Darshan*, and the Farmers Functional Literacy Project (FFLP) in the 1960s and early 1970s (Mathur, 1971).

Given the limited access of the rural population to radio and television at that time, these projects focused on providing collective access to media through radio forums, tele-clubs and literacy centers respectively. The geographical coverage of these projects was also limited due to the limited reach of the terrestrial broadcasting system.

It was the Satellite Instructional Television Experiment (SITE), a pilot project, launched during 1975-76 in 2330 villages from 20 districts of six states with the help of the American Satellite (ATS-6), that marked the beginning of using satellite television broadcasting for education and rural development. Besides providing general information on agriculture, health, family planning, national integration, etc., the SITE made the first attempt to use television for improving rural primary education through 'enrichment' programmes for school children, and conducted multi-media training programmes, using television, radio, printed material and contact sessions, on science teaching for nearly 40,000 rural school teachers. The SITE paved the way for the development of a nationwide television network in the early 1980s and provided impetus to educational television broadcasting for higher education and school education. The direction and use of distance tele-education has been conditioned by technological developments than by the educational needs and priorities of the existing system of education (Patel, 1997).

The introduction of nationwide programme of adult education, the National Adult Education Programme (NAEP) in 1978 provided impetus to promotional and motivational use of electronic media (radio and television) for supporting ongoing programmatic efforts. However, until 1990 none of the adult education programmes explored the potential of broadcast media for literacy teaching and learning. Literacy education continued to be imparted by literacy instructors in adult education centers with the help of printed material (literacy primer).

Convergence of satellite broadcasting with interactive technologies of telecommunication since early 1990s has opened up new technological options for rural development and interactive distance tele-education and training in India. During 1991-95, 24 experiments using one-way video and two-way audio for teleconferencing were conducted in the areas of distance education, rural development and industrial training. Among 18 such experiments in distance education, only one experiment was in adult education for trainers (see Patel, 1990), the remaining were for students in higher education (Patel, 1997:110-115). IGNOU has gained considerable experience through these experiments in teleconferencing for providing technology-based educational service to learners in higher education through community-based centers (Panda and Chaudhary, 2001:153-154), however, the major thrust of IGNOU has remained on promoting higher education. In the recent years, some efforts have been made by the government and NGOs to use ICTs for promoting rural development (Bhatnagar and Schware, 2000). Nonetheless, despite growing use of electronic media in large-scale adult education programmes, the delivery of literacy in these programmes has been primarily through face-to-face mode with marginal application of educational technology (Parhar, 1998). It is against the context of marginality of adult education within the general distance education system in India, and limited use of radio and television for directly imparting literacy instructions that a few innovative experiments were conducted.

### **Innovative experiments in ICT-based literacy education**

It was the shifting direction and approach of adult education policy and programme in the mid-1980s that provided impetus to using ICTs for imparting literacy. The National Policy of Education (1986) articulated for the first time the national commitment to addressing the problem of eradication of illiteracy in a time-bound manner with planned, concerted and coordinated efforts, and provided impetus to developing a mass approach to eradication of literacy. In pursuance of the mandate of the NPE (1986), the National Literacy Mission (NLM) was launched in 1988 as a societal and technology mission. Its objective was to impart functional literacy by 1995 to 80 million illiterate adults in the productive age group of 15-35 years, particularly among women, scheduled castes and scheduled tribes, and other disadvantaged groups, through mass mobilization and wider support of all sections of society in promoting literacy (Ministry of Human Resource Development, 1988).

The NLM shifted the direction of the adult education programme from the center-based approach to the campaign approach and introduced the Total Literacy Campaign (TLC) as a viable strategy for implementation of a large-scale area-specific, volunteer-based and time-bound literacy programme through decentralized administrative and

organizational structures. It also broadened the scope of adult education to promote literacy, post-literacy and continuing education among marginalized sections of society.

As a technology mission, the NLM attempted to demonstrate the use of science, technology and management for tackling the enormous task of eradicating illiteracy. Given the widespread illiteracy, the new techno-pedagogic approach of Improved Pace and Content of Learning (IPCL) was developed to enhance the quality of learning materials, while shortening the time-span for achieving the NLM norms of functional literacy. In the context of a technology mission, application of modern electronic media became relevant inputs for the NLM to improve literacy teaching-learning process.

The NLM introduced two major experimental projects using radio and television for adult literacy. Furthermore, opportunities provided by the Jhabua Development Communication Project to use satellite broadcasting for rural development, and convergence of information technology with communication technologies also led to some experiments in ICT-based literacy education. The subsequent section discusses these experiments and the extent to which they succeeded in imparting literacy education.

### ***Literacy through radio***

In India, radio has been used extensively by the government for disseminating information about various development issues, while meeting some of the information needs of rural communities. However, the potential of a non-visual medium of radio for imparting literacy instructions and training did not happen till the NLM conducted the Project in Radio Education for Adult Literacy (PREAL) in 1990. To what extent PREAL succeeded in imparting distance literacy education to adult learners?

### ***Project in Radio Education for Adult Literacy (PREAL)***

PREAL was launched in 1990 as a collaborative project between the NLM and the All India Radio (AIR) in which women were identified as the primary intended beneficiaries. It was partly funded by the UNICEF. The Directorate of Adult Education (DAE) conceptualized PREAL and implemented it in 17 technology demonstration districts of four low-literacy, Hindi-speaking states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh in collaboration with several government agencies and institutions. Radio-cum-cassette recorders (two-in-one) were provided to over 3600 adult education centers under the project. The primary objective of PREAL was to use radio to promote literacy skills (reading only) and facilitate teaching of literacy in adult education centers. PREAL was based on the premise that the radio primer-based broadcast and the repetitive use of radio lessons in the non-broadcast mode would reinforce learning in adult education centers and supplement teaching of literacy skills by instructors.

Instructional content of the radio lessons was prepared after a detailed linguistic analysis of the existing IPCL primers and local materials. The core content of the radio programmes focused on learning and teaching of reading skills. The overall pedagogy for production of the radio lesson was predetermined. It consisted of three parts: *suno aur bolo* (listen and speak), *suno aur dekho* (listen and see), and *dekho aur padho* (recognize/decipher and read aloud). To enhance appeal and comprehension of the radio

broadcast, radio lessons weaved in cultural specificity of different regions by the way of music, drama and local idiom. The AIR had the choice of selecting the story, presentation style, language and the programme format, however, the hardcore literacy content was common to all radio programmes.

Twenty-six radio lessons on literacy were broadcast under the common title of *Nai Pahel* from seven local radio stations of AIR in the selected states on an experimental basis for six months to supplement teaching of literacy in the selected adult education centers. Language of the broadcast was both standard Hindi and a local dialect. To supplement radio broadcast, a radio reader, known as *Akashvani Pathmala*, was specifically prepared in standard Hindi for all the districts except for two tribal districts, and supplied to the selected adult literacy centers for all the learners. Each learner and instructor was expected to use *Akashvani Pathmala* during the broadcast. Each radio lesson of 15-20 minutes was broadcast once a week along with a repeat broadcast. At the end of the twenty-six radio lessons, the adult learners were expected to recognize and read all the alphabets of Devnagari script along with the words from their active vocabulary.

A comprehensive evaluation of PREAL by DECU/ISRO suggests that contribution of radio broadcast in accelerating literacy teaching and learning process remained marginal due to the problems associated with the project implementation (Agrawal, Joshi, Joshi and Pande, 1993). Though project planning, software production and preparatory training of PREAL instructors were effectively organized, implementation of PREAL suffered due to problems of project management. Logistic problems in timely distribution of radio primers and other material to the adult education centers, and poor maintenance of two-in-one radio sets adversely affected project implementation. Radio broadcast was regular, easy to understand and followed the "*suno-dekho-padho*" pedagogy, and learners and instructors found radio lessons interesting and useful in teaching and learning. The exposure of learners to radio broadcast was, however, very low due to poor attendance of adult learners in literacy classes and inadequate monitoring and supervision of adult literacy centers in the villages. The prevailing socio-political situation also adversely affected project implementation. The shift in the NLM's strategy from the project approach to the campaign approach in the late 1980s also contributed to uncertainty and confusion at state level.

In summary, the experience of PREAL was very valuable. It clearly showed that it is feasible to produce radio broadcast for supporting literacy teaching. However, the role of radio in literacy teaching and learning in the context of adult education programme needs to be further explored. Management and implementation of a project such as PREAL also requires far greater coordination with and involvement of adult education functionaries.

### ***Literacy through television***

Audio-visual medium of television has been used for distance education at higher levels. In adult education, however, no systematic efforts were made until 1990 to teach literacy through television. Two experiments in imparting literacy through television show how television can be used for literacy learning and teaching.

### ***Chauraha***

A television serial of 40 episodes, *Chauraha*, was the first experimental project that used television for teaching literacy. Doordarshan, the public broadcasting system, transmitted the serial for six months in 1992 for poor and illiterate women in Delhi slums and villages around Delhi. The Directorate of Adult Education in collaboration with the State Resource Center (SRC), New Delhi, conducted this UNICEF-sponsored experiment.

*Chauraha* focused on imparting rudimentary literacy skills (writing) in Hindi, while generating awareness among women learners to empower them through a powerful narrative situated in rural India. It used an innovative and absorbing approach to teach the viewers Hindi alphabets through Devnagari script. Besides linking the content of television programs with the literacy primer used by the learners in adult education centers, television programs were grounded in the day-to-day realities of learners. *Chauraha's* entertaining format combined village soap opera with muppets and animation.

Doordarshan telecast *Chauraha* more than once, but it neither telecast the serial at a suitable time nor gave advance notice for the broadcast so that wide viewership could be ensured. The telecast of *Chauraha* was also not supported by the adequate system on the ground. To reinforce teachings of the television programmes, *Chauraha* telecast was not linked with ongoing literacy teaching in adult education centers. Inadequate infrastructural facilities, lack of training of volunteer instructors in using television broadcast for literacy teaching and learning, and lack of additional reading materials on *Chauraha*, were some of the problems with the reception of *Chauraha* in adult education centers (Ghosh, 2000:21). Thus, educational potential of *Chauraha* remained unexplored due to lack of support system for utilizing the telecast in adult education centers.

Nevertheless, quick appraisal of *Chauraha* by the SRC showed encouraging results in terms of literacy learning and social awareness (ibid.). The study reported significant differences in literacy achievement (particularly in writing skills) among learners of adult literacy centers where *Chauraha* was screened either through television (broadcast mode) or VCR (non-broadcast mode), as compared to learners from literacy centers where no screenings were held. SRC (New Delhi) also explored the educational potential of *Chauraha* by using it in adult literacy centers in the non-broadcast mode, while supplementing literacy learning with a set of charts and book based on the sequence of alphabets and words taught through the television serial.

In summary, *Chauraha* remained an important landmark in India for television software development on literacy. This experiment showed the feasibility of using entertaining format for teaching literacy through television serial. At the same time, it highlighted limitations of television in imparting literacy skills without adequate field support.

### ***The JDCP experiment***

The Jhabua Development Communication Project (JDCP) was introduced in November 1996 by the Development of Education Communication Unit (DECU) of the Indian Space Research Organization (ISRO) to use the dedicated satellite-based Rural

Development Communication System (RDSCS) for meeting communication needs of the predominantly tribal and underdeveloped district of Jhabua in Madhya Pradesh.<sup>1</sup> The Interactive Training Program (ITP), using one-way video and two-way audio teleconferencing via satellite, was an important component of JDCP for training development functionaries at block and village levels. In the light of effectiveness of the JDCP (Shah 1999), the project was extended till October 1999 and expanded to all 612 *panchayats* (local political councils) of the district by DECU/ISRO to focus on some of the thrust areas of development where television could be effectively used for a large population.

In JDCP, evening television broadcasting for the general audience in the areas of health, agriculture, watershed management, education and *panchayati raj* had built-in component of adult education. However, given the low level of literacy (14.54 per cent in 1991) in Jhabua district, DECU/ISRO decided to give priority to promoting adult literacy through television. The district administration was also keen to revive literacy efforts for its post-literacy programme and use television to motivate learners and volunteers. The JDCP provided an opportunity to use satellite television broadcasting for supporting ongoing literacy programme in the district. Television was expected to supplement literacy teaching and learning in the existing adult literacy centers, and motivate learners and volunteers for participation in district's post-literacy campaign. The JDCP literacy project was implemented by DECU/ISRO as a lead agency in collaboration with the State Resource Center (Indore, Madhya Pradesh) and the District Adult Education Administration of Jhabua. Interactive Training Program was also organized to orient the teachers and co-coordinators participating in the literacy project, while face-to-face training was conducted by the SRC for volunteer instructors.

In the JDCP literacy experiment, production of television programmes was a major challenge. There was considerable debate and discussion on the style, format and language of television programmes for supporting literacy teaching in adult education centers (Ghosh, 2000:49-66). First 20 television programmes were used to generate awareness about the literacy programme and motivating learners for learning. Then, 58 television programmes, loaded with literacy content, were broadcast to support the existing IPCL primers for basic literacy. Programmes used simple Hindi along with some local words in drama and songs. However, unlike PREAL and *Chauraha*, there was a wide variation in format as well as style and use of animation presenting literacy content (ibid.:98). Thus, eventual impact and usefulness of these programmes in literacy centers remained limited.

A detailed documentation of the JDCP literacy experiment revealed logistic problemmes in project implementation (Ghosh, 2000). Despite sincere efforts by DECU/ISRO to involve the state government and district authorities in project planning from the beginning, they did not have a sense of ownership of the project. They also lacked clear understanding of the complex nature of implementation of the television-based literacy project. In practice, technology and systems management took priority over sustaining community's participation in implementation of the project at the village level. The literacy classes and television viewing of the lessons did not take place everywhere as envisaged by the project.



Evaluation of the JDCP literacy experiment could not examine the potential of television in facilitating literacy teaching and learning process in adult literacy centers because of low attendance and closure of many literacy classes much before the transmission of all the literacy lessons (Das and Nunes, 2000). The overall context of underdevelopment and persistent poverty that characterized the lives of adult learners was a major constraint to participation of adult learners in literacy centers. Limited success of the experiment was also attributed to lack of involvement of district and field staff in project implementation, lack of relevant and additional basic learning and teaching for literacy instructors and learners, and lack of basic infrastructural facilities (uninterrupted power supply and a functioning television set) in literacy centers. Thus, the JDCP experiment in promoting adult literacy through television remained “a top-down, technology and management driven project” with very limited benefits to adult learners for acquiring basic literacy skills.

### **Literacy through information technology**

Rapid changes in information technology and its convergence with communication technologies have opened up new avenues in delivery of distance education and revolutionize modes of multi-channel learning (Parhar, 1999). However, use of computer-mediated learning in distance education system in India is very limited, as every student of distance education does not have access to a computer. A few online courses in higher education are offered, but mostly in the areas of computers and information sciences. With development of new communication technologies, there have been occasional experiments in teleconference- or computer-based rural education and training (Panda and Chaudhry, 2001). However, use of information technology for directly imparting distance instruction even at higher levels of education in India is not widespread. Applications of IT for improving school education in rural areas are just emerging (for example, Project Vidya of Intel, Schoolnet, etc.). Recently, two innovative projects have attempted to use IT for imparting basic literacy skills.

#### *Commonwealth of Learning Literacy Project*

The Commonwealth of Learning has undertaken a three-year pilot project (1999-2002), funded by the British Department of International Development (DFID), in Zambia and India to “explore ways in which literacy programmes might be enhanced through the use of information and communications technologies” (<http://www.col.org.models/literacy.html>). The stated objective of the Commonwealth of Learning Literacy project (COLLIT) is to “demonstrate and evaluate the appropriateness and effectiveness of technology-based community learning centers through which literacy workers can provide training programmes that develop learner competencies in reading, numeracy and in the use of information and communication technologies” (ibid.). In India, the project aims at adding value to the ongoing literacy efforts of the NLM. It has focused on development of literacy materials that can be used for literacy teaching and learning in local technology-based community learning centers (TCLCs). The project is implemented by the Indira Gandhi National Open University (IGNOU) through its Center for Extension Education since August 1999 in collaboration with the State

Resource Centers of Rajasthan and Madhya Pradesh, and the M.S.Swaminathan Research Foundation (MSSRF) in Tamilnadu. Eight TCLCs are established, two by each SRC and four by the MSSRF. As MSSRF has joined the project recently since March 2001, discussion in this section is based on the work undertaken by both the SRCs.

It is too early to speculate about the effectiveness of TCLCs in promoting literacy. However, early findings of the project are encouraging. In the initial phase, the project has focused on developing the capability of SRC and TCLC staff for using ICT appliances in literacy work. Before the COLLIT project, SRCs mostly developed print-based literacy teaching-learning materials, however, with the availability of ICT appliances (computer/printer, scanner, CD writer, handcam, digital camera) and training in each SRC, the core project staff of the SRC have started modifying the existing print material and developing project-specific materials for literacy instructors and learners.

The process of setting-up of the TCLCs at the local level was influenced by initial delay in provision of ICT equipment (two computers, a laser printer, television, VCR, audio cassette player and a still camera), and the institutional constraints of SRCs. However, each SRC has made considerable efforts for community mobilization and environment-building in local communities to motivate learners to join the centers and generate community support for running the centers. Besides imparting literacy education to illiterate and neoliterate adult learners, each center also attempts to demystify technology by providing training to school children and drop-outs to use computer and other ICT equipment for learning.

Despite problems related to communication infrastructure (irregular electrical supply, unavailability of telephone connection at the village-level, etc.), the TCLCs have started functioning. Semi-literate and neoliterate learners have started using their technical skills in literacy learning through computers and other equipment. They have also generated pictorial material with the help of MS-Word, PaintBrush and Clip Art and started writing. In the initial stage, progress of literacy acquisition among learners has been slow as learners were involved in learning the operations of ICT equipment.

### *The Computer-Based Rural Literacy Project*

The NLM introduced a new pedagogical approach, known as the Improved Pace and Content of Learning (IPCL), based on a number of linguistic methodologies (for example, synthetic, analytic and eclectic) for improving the pace and quality of literacy learning among adult learners. The IPCL approach was envisaged to enable learners to attain the expected levels of literacy as per the NLM norms in about 200 hours over a period of 6-8 months. In practice, it was difficult to sustain learners to study in literacy classes while they struggle daily for survival. Computer-Based Rural Literacy Project (CRLP), a pilot project, has been undertaken in Andhra Pradesh by the Tata Consultancy Services (TCS), India's leading software services company, to impart functional literacy in short duration (Noronha, 2000). The project aims at reducing widespread illiteracy in rural areas by using information technology and other appropriate forms of education. After initial experiments in Beeramguda (Medak district) on the outskirts of Hyderabad city in February 2000, the project has expanded to 80 locations in Andhra Pradesh.

The literacy module in the project has used the IPCL material produced by the NLM. It is based on the premise that reading skills are key to creating awareness among people. If a person can read, then he/she can get access to information and knowledge that is available in written form. Instead of alphabet-based literacy teaching, the project uses the word-approach for enabling learners to first build the vocabulary of 300-400 commonly used words. The project team has identified about 500 words in Telugu that are essential for an illiterate person to know before he/she can read. Literacy instructions start with familiar words that are selected from the themes and situations commonly found in a given community. As Indian languages are phonetic, alphabets and script are introduced through the sounds that make up such words. Word games are also used to reinforce the recognition of these sounds and letters in different contexts and to construct new words with the composite letters. Duration of the literacy class is flexible, determined by the attention span of adult learners. The project claims that only 18 computer-based training sessions are required for the entire course in Telugu.

The CRLP is implemented with the help of volunteers who teach people in the villages with the use of computers. To overcome the obstacles of placing stand-alone computers in remote rural areas, the project has used the wireless local loop communications technology and built the communication infrastructure for the project without laying physical lines. The instructional software has also been developed while keeping in mind the low-end computers. The project claims that rudimentary reading skills can be acquired within four weeks and reasonable reading ability can be inculcated within eight to ten weeks. Given the limitations of visibility of the display on computer monitors, about 15 students can be accommodated in a class per computer. One teaching site of the project is expected to enable 300 adults to read functionally in a year.

Thus, sporadic efforts have been made in India in the recent years to use ICTs for imparting literacy skills. These experiments suggest the potential of using ICTs to supplement teaching-learning process in literacy centers. However, none of these experiments have been implemented on a sustained basis.

### **Conclusions**

Without basic literacy skills, the unschooled youth and adults are disadvantaged in the knowledge-driven global economy. Eradication of illiteracy in India in the immediate future is a stupendous and challenging task. It demands sustained large-scale efforts and multi-pronged strategy. ICTs have considerable potential for promoting adult literacy education. However, the Indian experiments in instructional use of radio, television and information technology for imparting literacy education suggest that technology is not a panacea for tackling the problem of massive illiteracy in India. Effective use of ICTs for teaching literacy to adult learners is conditioned by several factors.

For technology-mediated open and distance literacy education, easy and sustained collective access to technology is most crucial. Concerted efforts are required to ensure equal access to technology by learners from the marginalized communities at the receiving end (adult literacy centers/classes). The task is not merely installing ICT equipment in the literacy center, but ensuring that basic communication infrastructure

and the support system are available on a sustained basis to facilitate effective utilization of technology for learning in the rural context.

The effective applications of ICTs for literacy education do not only require appropriate technologies but also a system that supports technological interventions in the field over a period of time. Besides investment in communication infrastructure, potential of ICT-based literacy education cannot be realized without adequate organizational and logistic support. The Indian experience shows that large-scale literacy interventions built around ICTs are complex, requiring far more attention for project planning, management implementation and coordination than traditional literacy programmes.

The innovative experiments in ICT-based literacy education in India suggest that it is feasible to use ICTs for supporting teaching-learning process in the learning environment of literacy centers. However, production of technology-based literacy curriculum and materials requires considerable time and efforts. It is far more challenging to develop such material than preparing print-based literacy content. The Indian projects showed that it is possible to develop culture-specific and local literacy content in multi-media formats. Integration of print-based literacy curriculum and material with the ICT-based material is very crucial. Furthermore, appropriate pedagogy is also necessary for integrating technology-based learning with face-to-face instructions.

Availability of ICTs and print materials in literacy centers per se will not ensure acquisition of literacy skills, unless the use of ICTs for literacy teaching and learning is facilitated and sustained by the field staff, particularly the instructors or facilitators of adult literacy center. Technology-mediated literacy learning demands considerable involvement of literacy instructors not only in teaching literacy but also in managing the technology in the literacy center.

Given rapid technological change, ICTs can be harnessed to promote adult learning and literacy. The challenge before us is to use them for reaching the unreached, the vast population of illiterate youth and adults, whose learning needs are not yet met by the existing system of education. However, technology is not an end in itself, but it is a means to achieve the broader goals of lifelong learning in the present context of changing requirements of knowledge and skills.

## Endnotes

- 1 The systems configurations of the JDCP includes 150 Direct Reception Systems (DRS) in the selected villages, 12 talkback terminals at block headquarters, community television sets, and one studio and earth station at ISRO campus (Ahmedabad).
- 2 Discussion in this section is based on fieldwork undertaken by the author as a national evaluator of the COLLIT Project in India. I wish to thank Dr. Glen Farrell (International Project manager), Dr. Judith Calder (International Evaluation Consultant), Dr. Anita Digne (National Project Director), and the core project staff of SRCs and TLCs for their help and support with the evaluation. Views expressed are, however, that of the author.

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