



# Literacy Innovations



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International Literacy Institute

E d i t o r i a l

## Technology for Literacy

The use of technology for education has been popular ever since the creation of the reed pen and papyrus paper. Indeed, technology and other tools that can enhance humans' basic skills are increasingly included in the definition of literacy itself. Further, as we approach the year 2000, the discussion of using technology—especially advanced telecommunications—for education and for literacy work has become ever more intense. Much of this work is still in its infancy, such as efforts to utilize synthetic speech to teach reading, or the use of multimedia displays (interactive video, audio tapes, and computer displays) to provide much more sophisticated instruction than has been heretofore available. And, as the reader will see in this issue of *Literacy Innovations*, the multiple uses of the Internet are at the cutting edge of technology for literacy. Now accessible from most countries of the world, the Internet offers tremendous possibilities to improve the communications infrastructure for literacy programs within and across countries. Similarly, distance education—using radio, television, and other means of communication—is likely to see a dramatic growth in the decade to come.

As many have pointed out, however, the cost of technology is high for industrial countries' educational programs, not to mention for the poorer, less developed countries. So, how should we plan for the future? First, it should be noted that the relative cost of computers continues to drop at an astounding rate, with the ratio of price to performance dropping exponentially in recent years. Furthermore, advanced technologies are increasingly available to the general public. The estimated number of Internet hosts doubles every 12–15 months, with the July 1996 estimate at about 13 million. If present trends continue, by the year 2000 the capabilities of advanced technologies are likely to go far beyond the elementary approaches of today and the projected number of hosts is expected to expand to above 100 million. However, there are already new technologies, like Web TV (Internet access through cable television), that might increase this number even more. One of the challenges over the coming years will be how to achieve the economical use of technology for education and literacy work in developing countries.

In this issue, we explore a number of promising and innovative methods for the provision of literacy education in industrialized and developing countries. Whether technology for literacy remains expensive or becomes relatively cheap, its spread throughout the world in the near future is a certainty, and its potential needs serious exploration by the community concerned with literacy work, both in school and out.

## Technology for Lifelong Learning: Problems and Possibilities

UNESCO's International Commission on Education for the 21st Century (Delors Commission) identified four cornerstones for education in the next millennium: learning to know, learning to do, learning to be, and learning to live together. Such learning will take place in contexts beyond formal schooling and will involve adults as well as children. Technology will play a major role in transforming this vision of lifelong learning into a reality.

Although technology alone will not provide solutions to all the problems that developing countries will face in providing literacy and lifelong learning opportunities for all in the 21st century, no country can afford to ignore the assistance and economies that technology can provide in meeting the learning needs of the next millennium. Nor can any country, no matter how poor, afford to delay in planning for technology. Making even small investments in technology now is the only way that all countries (and communities) can ensure that they will share in the benefits of the "Information Revolution."

In February of 1996, the OECD and the ILI's sister agency, the National Center on Adult Literacy (NCAL), organized a Roundtable in Philadelphia on "Technology and Lifelong Learning."\* The Roundtable brought together representatives from 20 industrialized nations to present case studies and to discuss common issues in the application of technology to adult learning. While many of the problems and prospects discussed at the Philadelphia Roundtable are shared by industrialized and developing nations alike, four concerns are particularly important for poorer countries—access, cost, impact on present and future educational systems, and issues of dependency.

Ensuring equal access to information for all learners will be a key problem for educators in the coming years. Although technology offers the prospect of information access to those who were formerly excluded by distance, time, or social status, it is also creating new zones of exclusion. The pattern of phenomenal growth in connections to the Internet is a good illustration of the way technology may create new inequities of access to

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## LITERACY WATCH

*Introducing LITERACY WATCH...Those who work in literacy know at least as well as those who work in other areas of education that the politics and policies of education—made at any level—can have a serious impact on how development is carried out, from finance and control, to the overall ‘climate’ in which the ILI literacy work is undertaken. This regular column, whose title is inspired by Dr. Akihiro Chiba’s paper delivered at the ILI 1996 World Conference on Literacy, will address such concerns, and urges its readership to bring to our attention political and policy issues (broadly defined) that concern professionals who work in this domain. Sometimes, as with the column in this issue of **Literacy Innovations**, the discussion will focus on international policy, but other columns may well deal with quite specific, but illustrative, local issues facing literacy workers. So, we welcome your contributions in this column.*

The *Final Report of the Mid-Decade Meeting of the International Consultative Forum on Education for All* (otherwise known as the follow up on the 1990 Jomtien Conference on EFA) has now been published. The Final Report makes special reference to issues of literacy and non-formal education. In a key section of the report’s *Amman Affirmation*, the authors suggest that there is a great need for “out of school literacy and education programmes for adolescents and adults... [and that] the best predictor of learning achievement of children is the education and literacy level of their parents. Investments in adult education and children are, thus, investments in the education of entire families” (p. 19). Later in the document (p. 38), a list of recommendations is made in this regard, such as a focus on ‘customer service’ as well as on the importance of linkages between formal and non-formal education—both major concerns of the ILI.

While the Final Report makes clear that literacy remains a central, indeed critical, issue for the EFA initiative, it also indicates that in the first half-decade since Jomtien relatively little progress has been made in reducing the female rate of illiteracy (one of Jomtien’s most important objectives). This is not surprising given the fact that major investments still need to be made in this area. Although the Final Report offers a re-affirmation of the importance of literacy, keeping it high on the international education agenda will require constant and assiduous work by all in the field. The coming UNESCO Fifth International Conference on Adult Education (CONFINTEA V), which will take place in Hamburg, Germany July 14-18, 1997, will provide an opportunity to showcase progress and raise awareness of the scope of work that remains to be accomplished in the field of literacy. ■

(For more information on CONFINTEA V, please contact the Unesco Institute for Education, Feldbrunnen str. 58, D-20148 Hamburg, Germany, tel: 011-49-40-448041-0, fax: 011-49-40-4107723, e-mail: [info.confintea@unesco.org](mailto:info.confintea@unesco.org), or see the CONFINTEA V web site at <http://unesco.uneb.edu/educnews/confintea/>.)

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information. In July 1995, it was estimated that nearly 90% of the Internet hosts were in North America and Western Europe! By contrast, connections to the Internet in Africa, Central and South America, and the Middle East accounted for only 1% of the total. Since the Internet doubles in size every 12–15 months, the value of the information resources that it carries also grows as does the unequal distribution of its users.

Cost is often the foremost problem in the minds of those considering the potential for technology to assist literacy and lifelong learning in developing nations. Yet in developing countries as in industrialized countries, the most difficult and expensive issues are human, not technical. Investments in equipment need to be supported by training and capacity building activities. Nations as diverse as Cuba, Malaysia, and South Africa have embarked on ambitious programs to provide computer literacy to all people—rich, poor, urban, and rural. A relatively small investment in people and equipment can be used to build the internal communication infrastructure that will need to be in place to realize technology’s potential benefits.

Technology is certain to have a strong impact on educators and on educational institutions worldwide in the coming years. The rapid expansion of radio, television, telephone, and computer networks is already having a profound impact on the ways that knowledge is created and distributed around the world. Technology is shifting the focus from teaching to learning and from limited term learning in classrooms to lifelong learning in communities, in the workplace, and at home. As a result, teachers and schools need to rethink how they plan and organize their work. Although teachers will remain central to most learning for both children and adults, supporting continued learning beyond schooling may mean shifting from a focus on transmitting content to training in “learning how to learn” and information management skills.

Technology also raises important issues of economic and cultural dependency related to the fact that the industrialized nations currently dominate the electronics industry. Educators and literacy planners in developing countries should keep in mind that, while budgeting for continuous upgrading of equipment to keep pace with rapid advances in technology development may be a sound strategy in many cases, the most appropriate technology is not always the “leading edge” one. Many developing countries are now taking steps to adapt relatively inexpensive technology to their own cultural and linguistic needs. China’s Xinhua News Agency, for example, recently initiated the China Wide Web (CWW), a separate Chinese-language network modeled on the Internet’s World Wide Web (WWW). Other examples will certainly follow with respect to information dissemination in the diverse languages and scripts of literacy work today.

In every nation, determining an appropriate role for technology will be a complex process. In this process, much will be gained from comparing and sharing the experiences of other nations and regions in managing the problems and realizing the potential of technology for literacy and lifelong learning. ■

\*OECD. (1996). *Adult learning and technology in OECD countries*. Paris: Author.

## Interactive Radio Instruction as a Medium of Distance Education

Distance education that utilizes interactive radio instruction (IRI) can provide a low-cost way of enhancing and extending literacy education and post-literacy practices in developing countries. IRI has evolved over time into a valuable educational resource that not only supports learning in school and community contexts, but has a particularly strong positive impact on the educational achievement of girls.

As early as the 1970s, innovative methods were pioneered for the use of radio in distance education to simulate “instructional conversation” and to encourage more active learning. IRI was first developed in the 1970s by the Nicaraguan Radio Mathematics Project. The instruction consisted of a Radio Mathematics program in which interactivity was characterized by a “conversation” between the radio teacher and the students. This “conversation” included a simulated dialogue between the radio teacher and students in which students responded, in chorus, at a rapid pace, to questions posed by the teacher.

Over time, interactive radio instruction has been expanded and adapted to other subject areas including language, science, health, and environmental protection as well as adult basic education and literacy. The adaptation of the original Radio Mathematics model to other subject areas created a need for a broader definition of interactivity, one that not only engaged students in conversation but that promoted more active learning. The following examples show a variety of activities associated with the use of radio as a distance education tool.

The Radio Language Arts Program introduced in Kenya in 1980 engaged school children in English lessons by creating the illusion of an invented world of interesting characters with whom students could interact. The Kenya program also directly involved classroom teachers in the radio lessons to provide supplementary mother tongue instruction, to prepare supplementary materials for reading and writing, and to evaluate and respond to students’ answers to questions posed during radio broadcasts.

In Papua New Guinea, the Ministry of Education has used Radio Science as a means of teacher professional development to promote the use of inquiry and hands-on methods of teaching science. Radio Science models inquiry teaching methods by guiding students through a problem-solving process consisting of a series of questions interspersed with musical interludes of 30–45 seconds, thus giving students time to think about their own answers before hearing several possible appropriate answers from the radio instructor.

Interactive radio has also been designed to reach out-of-school learners, both children and adults. In 1983 in the Dominican Republic, the RADECO interactive radio project was initiated to teach basic math and reading skills, as well as some science and social studies to children who had little or no access to school. Innovative features of RADECO included the creation of an infrastructure of modest shelters used as village learning

centers and the recruitment of radio-auxiliaries, or paraprofessional teachers, who distributed print materials and assisted children in following the radio lessons. In 1992, Honduras began an interactive radio project to teach math, literacy, and other subjects to adults. Like RADECO in the Dominican Republic, the Honduran project combines radio lessons with print material, and assistance from a radio-community monitor.

One of the important benefits of IRI is its demonstrated power to improve girls’ educational achievement. Not only do studies of students’ performance on pre- and posttests of the effect of IRI on achievement show promise of fostering the attainment of basic literacy skills, but these studies also show a narrowing of the gap between boys’ and girls’ educational experiences. In a regular classroom environment, girls are often less likely to participate than boys for myriad reasons, such as shyness or lack of self-assertiveness. Furthermore, teachers can exacerbate these learned behaviors by rewarding the boys in class while overlooking the girls’ input. The IRI distance education methodology offsets these factors by limiting the time in mixed-sex classrooms, thus creating a stress-free environment for active and interactive learning. Data from IRI programs in Papua New Guinea, South Africa, and Honduras show that both boys and girls performed better with IRI than did their same sex counterparts in control schools not using IRI. The positive effect of IRI appears to be relatively larger for girls and women than for boys and men.

Another area in which radio instruction has had a positive impact is in sustaining the postliteracy practices of adults living in rural areas of Tanzania. A study by Semali of the effects of different communication media on sustaining literacy practice found that listening to the radio was positively associated with reading ability among newly literate adults in these rural areas of Tanzania. This study demonstrated that literacy programs supported by radio as well as by the press and by rural libraries can have a significant positive impact on the literacy skills of adults, regardless of the economic and logistical challenges these adults face every day.

It is clear that IRI has an important contribution to make to expanding learning opportunities both within and beyond formal schooling. Furthermore, IRI has been particularly successful in narrowing the gap between boys’ and girls’ educational achievement and sustaining literacy practices in developing countries. Innovative ways of extending the limits to interactivity in radio as a distance education method will continue to emerge as this readily accessible and effective tool is adapted for new content areas and new populations. ■

*The information in this article is drawn largely from the following primary sources:*

Hartenberger, L., & Bosch, A. (1996). *Making interactive radio instruction even better for girls: The data, the scripts, and the potential*. Washington, DC: Advancing Basic Education and Literacy 2 Project.

Moulton, J. M. (1994). *Interactive radio instruction: Broadening the definition. Learn Tech Case Study Series No. 1*. A Project of the Learning Technologies for Basic Education.

Semali, L. (1995). *Postliteracy in the age of democracy: A comparative study of China and Tanzania*. San Francisco: Austin & Winfield.

## LiteracyLink: Advanced Technology and Adult Learning in the United States

In the United States, the literacy community will soon have available a “cutting-edge” program for using technology to improve provision of basic skills education for adults in the home, workplace, and even in public settings such as libraries. LiteracyLink is a partnership between the ILI’s sister agency, the National Center on Adult Literacy (NCAL), PBS Adult Learning Service, Kentucky Educational Television, and the Kentucky Department of Education. This partnership is an innovative, technology-based, integrated approach to adult literacy instruction that may well transform the way thousands of communities across America deal with the task of improving adult literacy. Funded by a major five-year grant under the U. S. Department of Education, LiteracyLink is a literacy instruction and staff development system that will incorporate on-line technologies (through the Internet and successor systems), video technologies (digital, closed-circuit, broadcast, satellite), and computer technologies (including digitized audio and video, computer-generated graphics, interactive multimedia, and text).

The LiteracyLink system rests upon three organizing principles. First, it leverages existing adult literacy materials and resources. Many excellent materials already exist; they simply need adapting to current technologies. Second, the system will soon begin delivering content in formats compatible with differing levels of technical sophistication on the part of the learner or literacy program. The essential computer interface software currently under development is simple and easy to use. Finally, LiteracyLink builds upon the existing publicly funded telecom-

munications infrastructure by offering an integrated package of video, voice, and data resources. Public television, a major part of that infrastructure, is now more than just broadcast television; it encompasses a range of converging technologies—satellite, digital compression, data exchanges via satellite, and on-line networking—that will encourage interactivity and connect learners, teachers, and schools. LiteracyLink is taking full advantage of this top-of-the-line telecommunication system.

The LiteracyLink on-line system consists of three key components: LitHelper, LitLearner, and LitTeacher. LitHelper is designed to provide a form of on-line assessment that will enable both learners and service providers to get a better and quicker idea of a desirable program of study. LitLearner consists of on-line lessons, which form the heart of the LiteracyLink program. The modules are organized around the five test areas covered in the General Educational Development (high school equivalency) program: Writing Skills, Social Studies, Science, Literature and the Arts, and Mathematics. The modules are being developed with two components—lessons and assessments—and will consist of interactive tutorials and/or simulations. LitTeacher addresses the pressing need for staff development resources and training. LitTeacher will assist literacy instructors in making effective use of curriculum materials and will create electronic communities of teachers for mutual support and encouragement.

The underlying technologies that host these three components are being developed to run on the Internet and serve to connect all the components of LiteracyLink. The partnership has the potential to dramatically extend the possibilities of learners to become connected with the infrastructure of educational resources that are growing daily and that will be carried further by LiteracyLink and its products. For more information, please contact the ILI or send e-mail to [ili@literacy.upenn.edu](mailto:ili@literacy.upenn.edu). ■

### INTERNATIONAL SUMMER LITERACY TRAINING PROGRAM

*Information about the program, its costs, and application forms may be requested from the ILI at:*

#### Summer Literacy Training Program '97

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