

# Literacy, Technological Literacy and the Digital Divide

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## The Literacy Divide

The United Nations estimates that there are one billion illiterate adults in the world today (about one-quarter of the world's adult population), the vast majority of whom are located in the poorest half of the world. Furthermore, recent surveys suggest that this situation is even more serious than previously believed. Industrialized (OECD) countries now admit to having very serious problems of their own in literacy and basic skills, with up to 25% of adults considered to be lacking the basic skills needed to function effectively in the workforce (see OECD/Statistics Canada, 1995; Tuijnman et al., 1997).

Of course, we should quickly note that these two statistics are a result of changing standards and definitions for literacy that have taken place over recent decades. Indeed, if the OECD standard for literacy were used to measure literacy in developing countries, the number of adult illiterates in developing countries would likely go up by at least two or three fold. This seems to be the case, in great measure, due to the often poor quality of primary schooling in many developing countries (Wagner, 2000).

## Technological Literacy

Clearly, the problem of inadequate literacy remains a surprisingly large and pressing issue around the world. As we move into the information age, many policy makers have been raising the issue of individual standards for knowledge of information and communications technologies (ICT) – what is often called “technological literacy.” Interestingly, no country appears to have on record exactly what technological

literacy really means, probably due to the rapidly changing nature of ICT developments across the globe.

We know also that educational and literacy levels play an important role in the likelihood that a person will own a computer or be linked to the Internet. This has led to the popularization of the notion of the “digital divide” – a gap that separates the “haves” and “have-nots,” irrespective of country. Consider recent statistics in the US (U.S. Dept. of Commerce, 1999):

- 61.6% of those with college degrees now use the Internet, in contrast to only 6.6% of those with an elementary school education.
- At home, those with a college degree or higher are over eight times more likely to have a computer than the least educated and nearly sixteen times more likely to have home Internet access.
- The “digital divide” for Internet use between those at highest and lowest education levels widened by 25% from 1997 to 1998.
- Those with college degrees or higher are ten times more likely to have Internet access at work as persons with only some high school education.

While data on Internet use is changing rapidly, the best available evidence suggests that Americans with less education – those who might benefit most from the Internet's educational value – are falling further behind in digital access.

It is fair to say that the “digital divide” is a global phenome-

non. In industrialized countries, the *knowledge economy*, powered by the Internet and e-commerce, has become a key driver of growth and productivity, leading to new levels of prosperity. Yet, at the same time, a *global digital divide* is growing, such that the poor and disadvantaged peoples of both industrialized and developing countries are falling further and further behind in education, information technology, and economic and social development.

## Bridging the Gap

To bridge this technological and education gap will not be easy. In the developing world, the disadvantaged in-school and out-of-school youth and adults are actually composed of many diverse groups, such as women, ethnic and linguistic minorities, refugees and migrants. This diversity is one of the most important features in understanding why narrowly focused, middle-class oriented, and “one size fits all” education programs - especially when complex technology is introduced - have often met with poor results and lost resources. Indeed, even the current dominance of the English language on the WWW has had, as a consequence, an exclusionary aspect to it.

In the richer half of the world’s countries today, it is not uncommon to find initiatives in education that involve ICTs in primary, secondary and tertiary (university) education. Yet, in the poor countries of the world (containing about 65% of the world’s population), relatively little has been attempted in this regard, and almost nothing for the most disadvantaged populations in these countries. This was one of the primary conclusions of the International Roundtable on *The Lifelong Learning and New Technologies Gap: Reaching the Disadvantaged*, held in Philadelphia in December 1999, which was co-sponsored by the University of Pennsylvania (National Center on Adult Learning [NCAL]/ILI), OECD, UNESCO, U.S. Department of Education, and IBM Corporation.

Another challenge from the December 1999 International Roundtable concerned how to avoid the inevitable problems and costs associated with the integration of emerging and changing technologies into educational programs and processes that are practical on the ground, especially in impoverished settings. Literacy programs, in particular, are susceptible to such problems, as this is an area which has been continuously under-funded, with relatively little professional

development and a poor technological infrastructure. Recent advances in the application of new technologies for youth non-formal education and adult literacy are beginning to appear. Clearly, without basic literacy skills, disadvantaged populations will have major difficulties in acquiring and utilizing the technological literacy skills needed for the new knowledge economy.

## Promising Initiatives

In recent years, some promising initiatives have begun to address literacy and technology gaps, especially in industrialized countries (Wagner & Hopey, 1999). In the U.S. for example, with federal education support, NCAL is working in partnership with the Public Broadcasting Service (PBS) and Kentucky Educational Television, in the *LiteracyLink* project, to create resources for American adults who wish a second chance to complete their high school diploma without having to set foot again in a classroom. Materials are being developed that will assist learners in preparing for the GED (U.S. high school equivalency diploma).



In addition, NCAL has been developing a staff training and development program for adult educators who wish to improve their instruction competencies in this domain. As of 1998, thousands of teachers across the United States have begun to utilize this system with an electronic community of teachers, on-line workshops, pre-evaluated websites, and a database of Internet-based lesson plans. This system is designed to provide teachers with specially tailored online access to a wide assortment of existing literacy

resources. A series of live satellite-based videoconferences (via PBS) is also provided to an average of 20,000 teachers and administrators annually.

*LiteracyLink* is currently in development, and research to better understand the impact of Internet-based technology on adult learning and literacy through distance education has just begun. Four general lines of research are being pursued: (1) What are the differences in literacy skill acquisition between those adult learners who use the online materials and practice exams and those who do not? (2) Does the use of online assessment make any difference in learning literacy skills? (3) What are the differences in the effective use of the online resources by students and by teachers that are attributable to particular instructional environments, such as library workstations, the workplace, or classroom instruction? and (4) What is the relationship of online resources and video to

learning, i.e., how does the use of video in conjunction with online activities affect learning?

*LiteracyLink* is one of the first and most comprehensive initiatives to harness the power of the Internet to provide instruction “on-demand” to adult learners, as well as communities, libraries, schools, and homes. Through this initiative, adult learners in the U.S. will have access to the widest range of relevant quality materials ever made available. Whether and how adult learners can take advantage of this system outside of the U.S. (there are no particular technical barriers except access to the Internet itself) remains to be explored.

## What About Developing Countries?

In developing countries, beyond issues of cost (which are declining rapidly), the benefits of ICT are actually rather well suited for coping with the problems of basic literacy and technological literacy. First, poor people in developing countries (and many in industrialized countries as well) tend to live in dispersed geographical contexts and are comprised of diverse populations of youth and adult learners. Second, there is limited and thinly distributed professional expertise in terms of teachers. And, third, there is a need to connect learners and instructors interactively in an asynchronous manner that takes advantage of learners’ availability outside of the classroom.

Thus, a focus on the professional development and training of teachers in developing countries (in a manner similar to what NCAL is doing in the U.S.) provides a relevant locus for this kind of effort, assuming the cost constraints can be met. Teachers may become “intermediaries” for bridging the digital divide for the tens of millions of low-literate or illiterate youth and young adults who are in school or are in non-formal education programs in developing countries. Teacher training resources can be delivered through existing training colleges, and would comprise CD-ROM based materials, collaboration technology for sharing materials, pupil training resources, and greater culturally appropriate and multi-lingual content.

To achieve this broad aim, and with an eye on both literacy and technological literacy skills, a number of basic principles should guide future activities to bridge the digital divide in

developing countries:

- Making sure that learning, rather than hardware, is at the center of any initiative on the digital divide;
- Ensuring a consumer-oriented and context/culture-sensitive approach that will maintain motivation and interest;
- Taking advantage of private sector ICT advances; and
- Maintaining focus on the poor and disadvantaged, rather than just on communities that only want ‘more’ technology.

In sum, the changing standards of literacy and technological literacy will likely produce a situation in which a digital divide will persist well into the future. There will always be, as there always has been, a gap between the rich and poor. However, in the area of ICT use and access, we can take steps that will narrow this gap rather than widening it, but only by paying special attention to literacy issues that can either hinder or help more people in gaining a foothold towards an increasingly technological future.

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