Introduction

Over the past thirty years, Non-Formal Education (NFE) initiatives have effectively used Information and Communication Technologies (ICTs) for mass literacy campaigns, training of health workers, and rural community development projects. In the late 1960s and early 1970s, Coombs and Ahmed, and Sheffield and Diejomaoh helped to define NFE as an alternative form of education that addressed learning that occurred outside of the traditional classroom environment in schools and colleges by adults and children (Anzalone, 1995, and Robinson, 1999). Recent innovations in ICTs like Very Small Aperture Terminal (VSAT) satellite communications, the Internet, and CD-ROMs are helping to create new innovative learning tools that will profoundly change the way NFE is delivered. This article discusses recent uses of ICTs in NFE, and will also examine implications for the future.

Early distance education NFE projects used print, radio, television, audiotape, videotape, and satellite transmission as an efficient and cost-effective way to provide illiterate adults and out of school learners with educational opportunities. With the development of new ICTs, the delivery mechanisms of NFE now include: personal computers, the Internet, the World Wide Web, CD-ROMs, and DVDs (Kerka, 1996). The use of new ICTs in NFE has created serious issues in the provision of NFE. The emphasis on using the newest ICTs has begun to shift the focus of NFE away from local community development and towards individual lifelong learning. The push to introduce new ICTs into developing countries may foster negative side effects associated with consumer-based economies, the continued dependency on technology from industrialized nations, and the shifting scarce resources away from poverty alleviating programs. The future use of the new ICTs in NFE in developing countries will greatly depend upon how well NFE practitioners manage the issues associated with the use ICTs in NFE.

Benefits of ICTs use in NFE

NFE distance education programs using the latest ICTs are beginning to provide workers with the opportunity to pursue lifelong learning. By the end of the 1980s, enthusiasm for formal education’s ability to mobilize needed human resources for economic development in developing countries had dampened. NFE distance education was recognized as a way to meet the needs of out-of-school learners and adult workers (Siaciwena, 2000). The attractive advantages of NFE distance education included the following:

- It requires fewer teachers to reach a larger number of learners.
- It does not require new brick and mortar schools, and can utilize existing schools during spare-times.
- It allows learners to continue to earn a living while attending classes during their spare time.
- It becomes economical once initial startup costs are paid because the marginal cost to enroll additional students is low. (Siaciwena, 2000).

Early studies showed that there was no significant difference in performance between students who received ICT delivered instruction and those receiving face-to-face instruction (Blurton, 1999). Once distance education was accepted as a legitimate way to deliver NFE, it has continually evolved by experimenting with new communication technologies and media.

Developing countries have a strong desire to build the necessary human capital that can support a market-based economy. Consequently, the desire for Internet-based NFE distance learning is continually growing (Menezes, 2000). There is now a proliferation of NFE distance learning institutions that provide courses to adult learners. For example, the University of South Africa (UNISA) now uses ICTs to offer relatively cheaply priced courses that attract students throughout Africa (Menezes, 2000). Established in 1997, The African Virtual University (AVU), started by the World Bank, now serves 12 English-speaking countries and three Portuguese-speaking countries via the Internet (Menezes, 2000). These virtual universities are delivering high-quality professional training via distance education on the Internet.

The latest ICTs are also being used to develop virtual learning communities for NFE purposes. Virtual learning communities are learning groups with a shared interest, who are able to overcome barriers of time, geography, age, ability, culture, and social status. (Blurton, 1999). For example, the Global Learning and Observations to Benefit the Environment (GLOBE) project “… links students, teachers, and the scientific research community worldwide in a virtual learning community to study the global environment” (Blurton, 1999, p 13). Another example of an innovative virtual learning community was the MayaQuest project (Blurton, 1999). This distance education initiative created an interactive learning expedition with five bike-riding explorers who were directed by the collaborative decisions of online learners...
Problematic Issues with ICT use in NFE

Barriers exist that prohibit the extensive use of ICTs in NFE in developing countries. These barriers are a result of issues relating to access, cost, and lack of locally developed content. The pressure for developing countries to allocate the necessary capital to develop the capacity to effectively use new ICTs may result in a lack of funding for NFE programs designed to build social capital.

The first barrier that prohibits the extensive use of ICTs in NFE in developing countries is the issue of the digital divide. The digital divide quantifies the lack of access of ICTs in developing countries. In the 1990s, 90% of the people living in developing countries had not made a phone call, and 40% of these people did not have electricity (Latchem & Walker, 2001). The statistical data of worldwide Internet use is even more disturbing. Only 2.4% of the world’s population has access to the Internet, and the graph below (Figure 1) shows that 7 out of 10 Internet users in the world come from either North America or Europe (Bischoff, 2001).

![Figure 1: Percentage of Internet Users in the World by Region](image)

One major factor that contributes to the digital divide is the physical geographic structure of the Internet. The Internet builds on existing telecommunication infrastructure, which biases access to major urban centers (Economist, 2001). Consequently, access to the Internet for the vast majority of people who live in the rural sectors of developing countries is nonexistent. As the Internet is evolving, mega data servers are becoming more consolidated in developed countries because these servers need to be near large power supplies and high-speed data communication lines. As a result, users in developing countries suffer from low data transfer-rates that limited their ability to utilize the latest multimedia innovations that run on the Internet. The digital divide is not just a result of physical limitations, but it is also related to levels of educational attainment.

The second major factor contributing to the digital divide is the high costs associated with purchasing and maintaining computer equipment (McLean, 2001). The costs associated with ICTs will force many education ministries to make difficult choices with the scarce resources available to them. As developing countries attempt to produce the necessary hu-
man capital for a ‘knowledge-based’ economy, more funding will be needed for formal higher education systems. Higher Education systems can readily take advantage of the use of the Internet, by gaining access to virtual universities from across the world. Consequently, focus on higher education needs may limit the growth of NFE distance learning programs that primarily focus on developing social capital in marginalized communities.

To summarize, new innovative pedagogical techniques that utilized the latest ICTs have the potential to dramatically increase the participation of disadvantage communities to increase their social capital. But the current reality of the digital divide prohibits the widespread implementation of new innovative uses of ICTs in NFE. The desire to develop the human capital for a ‘knowledge-based’ economy may shift scarce resources away from popular education initiatives to the formal education sector.

Conclusion
ICTs have been used in NFE to provide distance learning opportunities to a large number of learners over the past few decades. Distance learning NFE initiatives have used ICTs to increase work-related skills and productivity, and to help to build social capital for community development. But the digital divide may limit the widespread use of ICTs in developing countries. Consequently, the introduction of new ICTs into socio-economically disadvantaged communities can create both positive and negative effects. Therefore, the future use of ICTs in NFE in developing countries will have to find a balance between the need to increase human capital for production in a ‘knowledge-based’ economy, and the needs of marginalized communities to maintain their social capital against the continuing pressure of globalization.

Bibliography


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