Introduction

Context from EduSummIT2009 Call to Action

- To develop ideas on international opportunities relating to new and emerging technologies in order to address the needs of developing countries and promote global social awareness and responsibilities.

Research update & major issues

Technology has transformed all aspects of society, including the teaching-learning process. It is critical that specific groups within our society not be excluded from the benefits of these new developments. Not only must digital equity continue as a priority goal of all nations, but efforts to move toward digital equity also must be mobilized, focused, and coordinated to prevent the development of a permanent underclass in global society. The 2010 Education for All Global Monitoring Report warns that with 72 million children still out of school, a combination of slower economic growth, rising poverty, and budget pressures could erode the gains of the past decade. As noted by the UNESCO Director-General Irina Bokova, “While rich countries nurture their economic recovery, many poor countries face the imminent prospect of education reversals. We cannot afford to create a lost generation of children who have been deprived of their chance for an education that might lift them out of poverty.”

Changing Global Economies: The Exponential Growth of the Digital Universe

Last year, the Digital Universe, a term representing the amount of digital information created and replicated in the world, set a record. It grew by 62% to nearly 800,000 petabytes (IDC, 2010). To envision the amount of information this represents, think of a stack of DVDs reaching from the earth to the moon and back. It is estimated that by 2020, our Digital Universe will be 44 times as large as it was in 2009.

A Critical Need for Basic Skills and Digital Literacy, and a Growing Demand for Higher Levels of Education

Technology has created a wide array of jobs that did not exist ten years ago and has reduced the need for many types of unskilled or low skilled workers. Digital literacy is increasingly recognized as a critical for participation in a technology and knowledge-based global society. It includes the confident and critical use of ICT for work, learning, communication and leisure (European Commission, 2010) and is considered as one of the eight essential skills for lifelong learning (European Communities, 2007). A major challenge for education is to develop basic skills in a large portion of the world’s population. According to the most recent UNESCO Institute of Statistics data (2010), twenty percent of all adults, or 774 million, are not literate. Of those who aren’t literate, two-thirds are women. In addition, there are 75 million children who are not attending school and therefore not on the path to become literate.
Growing Demand for Teachers

A critical problem facing developing and developed nations alike is the growing shortage of teachers. In some countries, there are sufficient numbers of teachers entering the profession, but there is a problem in retaining them. In the U.S. approximately half of the teachers leave the profession within five years (Carroll, 2003). In 1999/2000 there were 25.5 million primary teachers worldwide, with varying qualifications and training (UNESCO 2002b). The estimated teaching force that will be needed across the globe will need to be increased by 2015. For example, 99 countries will need at least 1.9 million more teachers in classrooms by 2015 than in 2008 to provide quality primary education for all. More than half of this number will be needed in sub-Saharan Africa alone (UNESCO, 2010). The shortage of teachers has contributed to high pupil-teacher ratios. In the least developed countries, the ratio is three times higher than in developed countries, and class sizes of 100 pupils are not unusual.

The Digital Divide between Developed and Developing Countries

As of 2011 there remains a significant divide in access to information and media between developed and developing nations. For example, radio and television are traditional and well-established means of communication, information dissemination, and provision of learning opportunities. However, there are dramatic differences between developed and developing countries in access to these basic media (UNESCO, 2005). For example, there are a number of countries in Sub-Saharan Africa and the Asia-Pacific region where less than half of the households are equipped with radio and less than 25% have access to television. In these same regions, less than 10% of the population has access to a computer (UNESCO, 2005).

Access to the Internet

Nowhere is the digital divide more apparent than in access to the Internet. Europe has 65 Internet users per 100 inhabitants, while the Asia-Pacific region has approximately 22, and Africa has less than 10 Internet users per 100 inhabitants. These low levels of access pose the greatest challenge to the effective application of e-learning in developing countries.

Access to Mobile Phones

Perhaps the most important technological trend globally is the explosive growth of mobile phone access in both developing and developed countries. As shown in Figure 2, in the past ten years, the level of access to mobile phones in developing countries has moved from virtually zero to a current level of over 67 mobile subscriptions per 100 inhabitants. There is a need for research and development to explore ways this increasingly ubiquitous technology resource may be used to support learning.

Other Factors to Consider in Digital Access

The results of the International Telecommunication Union’s (ITU) international study of digital access suggest that other factors beyond infrastructure contribute to the digital divide. Minges (2003) states, “Until now, limited infrastructure has often been regarded as the main barrier to bridging the digital divide. Our research, however, suggests that affordability and education are equally important factors.” To measure the overall ability of individuals to access and use ICTs, the ITU study has gone beyond the traditional focus on telecommunication infrastructure, such as mobile phones and fixed telephone lines. For example, nearly 40 percent of Peruvians responding to the study said...
they either did not have a computer or could not afford Internet services, which points to affordability as a critical success factor. This is a typical challenge for many peoples across the globe whose communities and schools have had limited access to beneficial information resources.

Of growing concern to UNESCO is the digital exclusion of indigenous peoples who do not have access to computers, connectivity, or high-quality culturally relevant content in local languages. For example, in the U.S. at the end of the 19th century, there were over 600 Native American languages. Today, approximately 200 languages remain in current use, and about 50 of those languages have ten or fewer elderly speakers (Skinner, 1999). There are many examples that could be cited of the role media and technology have played in the loss of indigenous cultures and language (Mander, 1991) that reflect a form of cultural imperialism.

Native Use of Digital Technologies to Support Culturally Responsive Learning Resources and Environments
The new information and communication technologies offer the potential to empower indigenous communities to develop digital curriculum resources that reflect and honor their culture, history, and resident knowledge of the community. For technology to be a tool for empowerment, a number of conditions must be met: indigenous peoples must have access to quality computers, connectivity to the Internet, teachers who are skilled in using the new technologies, technical support, ongoing professional development, and high quality, culturally relevant digital content. Under these conditions, the digital technologies offer the potential for indigenous peoples to create their own cultural content and curriculum resources “at their own speed, in their time, under their own conditions, using their own knowledge and judgment that defines equity/equality (Delgado, 2003: 98).”

Action Items for Policy, Practice and Research
Technical Work Group 4 offered the following recommendations for action that reflect the shared view of the group that access to ICTs and the Internet should be a basic human right.

Policy
- UNESCO should develop a policy framework/guidelines to help countries develop national strategies and plans for the use of mobile learning to support formal and informal learning systems.
- UNESCO should encourage public/private sector collaboration within countries to reduce telecommunication costs for the use of ICTs in the education sector.

Practice
- UNESCO, ISTE and other organizations should work collaboratively to facilitate access to collection-links of promising practices and policies) by identifying the organizations that have such collections and securing agreements to provide access to their resources through a common portal.
- The portal should provide a description of the types of resources within each of the collection links.
- The resources in the portal should, where appropriate, be aligned with UNESCO’s ICT Competency Framework for Teachers.

Research
New approaches to research of the uses of emerging technologies such as mobile devices to support both formal and informal learning are needed. As technology continues to develop exponentially, the present models of research often creates a situation in which by the team the research results related to one generation of technology is available, a new generation is already in wide scale use in society. To accomplish this goal the following action steps are recommended:
• New research approaches that are similar to research in the technology industry are explored and adapted for use in education systems to provide more research-based information to help guide practice and policy. One such area is the rapid developments in devices that may be used to support mobile learning.

• UNESCO may help convene teachers, educators and policy-makers at a regional and/or global level to identify ways that mobile technologies may effectively be integrated to support learning in both developing and developed countries.

• The group of regional and/or global experts may develop benchmarks and policy frameworks and guidelines to help countries to plan, implement, support and evaluate the use of mobile learning in their educational systems.

• UNESCO and Summit partners may help disseminate new open research models that will help bridge the time gap between the availability of research findings to inform policy and practices

**Brief bibliography**


