

## **WORKSHOP 6**

### **Narrowing the Gap Between Information Rich and Information Poor:**

#### **New Technologies and the Future of Education**

##### **BACKGROUND PAPER:**

### **Introduction**

Many developing and developed countries are increasingly focused on improving access to quality education opportunities and see the use of information and communication technologies (ICT) and distance education as a vital means to this end. Given the information and knowledge explosion, the desire for access to quality education and the growth of technologies to support and enhance the education and training system, the opportunities for substantial strides to be made to improve education and training has perhaps never been greater.

While the opportunities are present, these will only be realised through sustained political and social will, the availability of people with the necessary skills to collectively take responsibility for strategising and implementing, and the provisioning of the necessary financial resources. Clearly if these elements are not present, the current scenario of an increasing gap between the rich and poor nations, the information rich and information poor nations, and the vast inequalities that exist between and within countries in various areas of the economy, health, infrastructure, education, etc. will continue if not speed up. The inequalities created can potentially lead to even more serious social upheaval.

This background paper focuses on one such area of inequality, viz. the gap between the information rich and information poor and the potential role of information and communication technologies to either decrease or exacerbate this divide within the education and training system. The paper will focus on the number of learners that are within the education system and the impact of ICT on the system. It will offer comments on the driving and constraining forces to the use of ICT to address this divide.

## **The Increasing Numbers**

Enrolment in all sectors of the education system has increased in recent years. Even though this trend is positive, there are still more than 113 million children between the ages of 6 and 12 that are denied opportunities to attend school. This figure is quoted from a joint statement issued by the Heads of UNESCO, World Bank, United Nations Population Fund, United Nations Children Fund and the United Nations Development Programme (Joint Statement, 27 April 2001) on the first anniversary of the Dakar World Education Forum that also noted that well over 60% of the 113 million are girls. In monetary terms, it is estimated that "two trillion dollars or one-twentieth of global gross domestic product" is spent on education (Guttman, 2000). Roughly speaking, one-fifth of this amount is being spent by the private sector while the rest is spent by governments on the public education system.

International and national campaigns such as "education for all" have succeeded in drawing learners into the education system. Approximately 76 developing countries have already achieved or are making sound progress towards universal primary education. However, some 32 countries are unlikely to achieve the target of universal primary education by 2015. Another factor resulting in more learners being drawn into the education system, albeit more at the secondary and tertiary levels, is the development of distance education opportunities. Research conducted by the International Data Corp indicate that "distance learning enrolments are growing by 33 percent and will reach 2.23 million in 2001" (DeVeaux, 2000).

Many students are attracted by the prestige of offshore degrees, and this trend is likely to continue as distance and virtual education develop further. In a recent travelling "road show" by three major U.S.-based universities, Lynne McNamara (Director of Programmes Development in Asia for the University of Maryland University College) projected that her university expects to have 70,000 to 80,000 online students by the end of 2001, many of them from Asia (Brender, 2001).

The private sector has also supported and at times been a driving force behind the increased participation in distance and virtual education. Employees who want to advance their careers, but who can't afford to take the time out to study at contact institutions, are attracted to virtual learning opportunities. Many corporations recognise the benefits of supporting such learning where they save both in training-related travel expenses and in employee productivity.

## **The impact of ICT**

Kofi Anan, the United Nations Secretary General, has noted the broader impact of ICT, asserting that:

Recent developments in the field of communication and information technology are indeed revolutionary in nature. Information and knowledge are expanding in quantity and accessibility. In many fields, future decision-makers will be presented with unprecedented new tools for development. In such fields as agriculture, health, education, human resource and environmental management, or transport and business development, the consequences could be revolutionary. Communications and information technology have enormous potential, especially for developing countries, and in further sustainable development. (Mansell and Wehn, 1998).

The use of ICT is a vital component of the new "information economy" and "information society." Mansell and Wehn (1998) also point out that the term "knowledge society" has enabled a shift away from technology as a driver of change to a tool that offers new ways of combining the information available with people who will drive development. This shift pressures countries to develop education systems that enable skilled people to work within the knowledge society and within the global economy. The result of such pressure on both developing and developed countries has been a massive increase in education and the drive for qualifications.

New technologies have made "the walls of the learning space transparent, providing a freedom for the learner to explore sources of information outside his institution, even outside his country" (OECD, 1994). While ICT has undoubtedly opened new avenues for increased numbers of learners, it has also opened new areas of research focusing on the role of pedagogical processes when using new technologies and on their impact on cognition.

The rapid development of virtual education is most noticeable in the developed world where there is much greater access to educational institutions and learning technologies, especially computers, CD-ROMs and the Internet. In the developing world, limited access to ICT is apparent. A recent report by Dennis (2000) noted that only 229.8 million or 5% of the world's population is online. The report also notes that this number is likely to increase to 640.2 million by 2004, which will represent approximately 14% of the world's population. Figures from U.S. government sources are slightly more generous. They put the number of people connected to the Internet at 332 million, with only 1% living in Africa. And fewer than 5% of the computers connected to the Internet are in developing countries. The figures proposed by the International Data Corp estimate that by 2003, the

number of Internet users worldwide will grow to about 508 million, up from 87 million in 1997 (Smith, 2000).

As access increases, the corporate world will focus on their ability to exploit Internet and e-commerce opportunities. Employees will need to rapidly develop their knowledge and skills to use the technology and to re-design the business process. Many businesses will encourage in-house and distance education and training, and they will complement this with e-learning. One prediction suggests that by 2003, less than 30% of formal corporate learning programmes will employ the traditional classroom model (Galagan, 2000).

Because the above projections were made prior to and during the crash of the technology market of 2000/2001, some argue that they are incorrect. However, the effect is likely to be minimal. Current research indicates that while the education market has "declined in tandem with other sectors that make up the Internet economy, the sector encompassing corporate e-learning providers and companies serving the K-12 and higher education markets hasn't suffered more than other sectors anchored in Internet technologies" (Barron, 2001). Barron notes that many companies view e-learning as a strategic necessity that is vital in today's knowledge economy. He goes further to note that e-learning and broader educational technology areas are faring relatively well in a slowing economy.

## **Limits to Access**

While ICT makes it possible for many potential learners in many parts of developing countries, including remote and rural areas, to have access to education, such access is very limited. There are a number of technological constraints that restrict its use within the education and training system. For one, the telecommunications infrastructure (telephone and other communication facilities) outside many of the major cities in developing countries is limited and inadequate. A few examples illustrate the problem:

- Africa has approximately 12% of the world's population, but only 2% of the global telephone network. Telephone density is less than two lines per 1000 people. These figures become even more startling when compared with Asia (48 per 1000), America (280 per 1000), Europe (314 per 1000) and high-income countries (520 per 1000) (Osei Darkwa and Fikile Mazibuko, 2000).
- Nigeria is the most populous country on the African continent. However, the services provided by its state-run phone company, NITEL, are meagre for a country of 108 million people. In terms of the Internet, there are fewer than 500,000 lines connected (www.kabissa.org, 2001).
- Internet reach in India has doubled from a subscriber base of one million to over two million within six months in 2000. However, when this impressive figure is matched

against the total population of India of one billion, you get the sense of the magnitude of the lack of access to computers and the Internet.

- The situation in Latin America indicates huge disparities. In the mid-1990s, few people in South America, rich or poor, owned a computer or had access to the Internet. The changes have been dramatic over the last few years. Now 35 million Latin Americans own PCs and 20 million use the Internet, but the poor have been largely left out of this development. In Brazil, for example, 72% of the 7.7 million Internet users are from the wealthiest fifth of society with only 8% coming from the poorest fifth. (Margolis, 2001).

## **DRIVING AND CONSTRAINING FORCES TO USING TECHNOLOGIES IN THE EDUCATION AND TRAINING SYSTEM**

### ***Driving Forces***

The need for increased access to quality education and training, coupled with the pressures on financial resources to meet increasing education demands are two key driving forces behind the rapid use of technology to enhance learning. As noted earlier, there has been a massive increase in the number of students enrolled in various sectors of the education and training system, with many more still unable to access the system. There has also been increasing demand for professional development opportunities that has resulted in the rapid increase in the number of private sector providers using technology to deliver education and training. This growth, coupled with the developments in ICT, has resulted in learning being accessed in creative ways.

The concern to bridge the digital and information divide is also an important driving force in the development of innovative mechanisms to access learning using technology. This is best illustrated by the recent meeting of the world's richest nations at their G8 conference in Okinawa, Japan. The Japanese prime minister announced that Japan is committing U.S.\$12 billion in loans and U.S.\$3 billion in grants over the next five years to ICT technology initiatives in the developing world. This announcement was coupled with a set of proposals constructed by a task force established at the 2000 Davos meeting that called for, among other things, the creation of a Peace Corps-style group called the Global Digital Opportunity Corps and the establishment of local technology community centres.

With the drive for learning comes the need for individually tailored education that takes account of a person's capability, potential and level of maturity in terms of his or her own learning progress. The capability of individuals to tailor their own education has been helped by technologies that allow for the development of learning objects. These objects

can then be aggregated into courses with the necessary credits that allow the learner to construct their learning pathway. This enables individual learners to access education opportunities using ICT and thereby ensuring a greater education and technology market.

Access is not only about hardware and software; it is about creating an environment that attracts students by providing them with a place to meet their peers and teachers/tutors and with access to resources necessary to complete their courses. (OECD Report, 1994). The need for more physical space in the form of traditional classrooms is often resisted in developing countries because of the cost. The notion of multi-purpose learning centres offers a more cost-effective use of such physical infrastructure. As Bester (2001) has written, a further driving force supporting the development of multi-purpose learning centres is the potential to cater to "diverse and varied community education needs over the wider age continuum...these centres have the potential of offering programmes directed at preparing learners for the world of life and work beyond school, and more specifically, to become competent citizens in the information age and knowledge society." Simply, these centres are able to be flexible and respond to changing demands for different learning options.

Multi-purpose centres also allow learners to work on their courses at a time and place convenient to them (assuming the centres are in close proximity and are open for long hours). This flexibility allows students to engage with tutors and course developers via e-mail rather than having to wait for a time and place in a traditional space of the lecture or tutorial room. It also allows the students more opportunities for peer engagement.

### ***Constraining Forces***

The strength of being able to access learning at all times can be restricted by other resource constraints. For example, by increasing access to the technology, greater demands are placed on the time of the tutor or instructor. These demands are for quick responses to queries, assignments and other work for assessment, update web sites and electronic discussions. This requires proper planning, both for the network that is being used to engage with students and with the response time for feedback to students.

There are a variety of other constraining forces that hinder the development of innovative learning spaces:

- Access to connectivity remains one of the major challenges facing many developing countries. Darkwa and Mazibuko (2000) correctly note that students would need access to computers that can send and receive messages using Web browsers such as Explorer or Netscape. In addition, they would have to find on their computers word processors and other applications to complete basic assignments. Easy and inexpensive connections to Internet service providers would be required. In addition, depending on the

nature of the given course, students might be required to use a VCR to play videotaped instruction and perhaps tape recorded lectures. Textbooks and other printed materials would still be part of the curriculum. All of these basics require funds that many individuals and institutions simply do not have.

- The issue of costs is also a hindrance to developing learning spaces. Governments in many developing countries have stopped building schools and classrooms on any meaningful scale. It is left to donor agencies and the private sector to consider building classrooms. The costs associated with using ICT are also prohibitive in many developing countries. While the unit costs of hardware and software are being lowered in terms of the U.S. dollar, the worsening exchange rate of developing countries means that there is no appreciable drop in costs when expressed in local currency.
- The successful use of multi-purpose centres for virtual education relies on trained and professional support. Learners normally require support, whether online or at the centres where they access the learning materials. This support, however, is often lacking in developing countries where, to date, very few scholars and teachers are familiar with using technology to teach and support learning. This situation poses a threat to being able to develop technology enhanced learning as well as to the development of online courses that are context-specific to a country or region.

## CONCLUSION

Clearly the opportunity to bridge the information, digital and knowledge divides are great, and requires bold and innovative policies, strategies and actions. This requirement is most needed within the education and training system that serves as the platform for economic, social and environmental development.

Increasing the availability of information and communication technologies to bridge the above divides and expand and solidify the education system would help ensure this platform is developed. By agreeing on the need to construct policies and strategies in this regard, people are demonstrating their faith in the potential of new technologies to bridge the divides, to enhance educational opportunities, and to help build platforms necessary to underpin a better life for all.

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