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## The Changing Venues for Learning

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### Introduction

Historically, the learning process has taken place within the infrastructure of institutions such as schools, university campuses, technical colleges, etc. The need to be part of such institutions was driven by the notion that to access information and knowledge, a learner had to be present where the teacher was. The first separation between the teacher and the student occurred with correspondence education, which offered information and knowledge mediated by some format of media, usually print. This early form of distance education moved the learning venue to the learner's home.

The development of information and communication technology (ICT) and its application to education and training has increasingly allowed institutions to deliver learning in a variety of venues. Now, the choice of venue is driven by, among others things, the ability to access the learning materials using ICT. Many potential learners do not have ICT in their homes, so there is a need to find alternative ways to access such learning experiences.

Institutions using ICT as the delivery platform for learning can be defined as virtual institutions. This chapter focuses on the issue of access to virtual education. It describes the increased need for quality education and the role

of ICT in increasing access, particularly in developing countries where education and training is crucial to economic and social development.

The chapter also describes the traditional learning venue and how it is changing in order to increase access to virtual education and training. There are different driving and constraining forces behind this development, and these are examined as well. The chapter ends with an outline of four major considerations that need to be addressed if these innovative learning venues are to be developed and sustained to deliver quality education and training to learners.

### Access to Connectivity and Learning Technology Appliances

#### THE INCREASING NUMBERS

Enrolment in all sectors of the education system has increased in recent years. 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, but the development of distance education opportunities has also had much to do with the growth in numbers. 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 off-shore degrees, and this trend is likely to continue as distance and virtual education continue to develop. 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 been a driving force behind the increase in 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 studies: they save both in training-related travel expenses and in employee productivity.

## THE IMPACT OF ICT

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.

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.

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 eMarketer (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 officials are slightly more generous. They put the number of people connected to the Internet at 332 million, with only 1% living in Africa. And less than 5% of the computers connected to the Internet are in developing countries. (See [info@balancingact-africa.com](mailto:info@balancingact-africa.com), 15 Jan 2001.) 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, in the corporate world, companies 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 virtual education. For one, the telecommunications infrastructure (telephone and other communication facilities) outside many of the major cities in developing countries are 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) (Darkwa and 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.
- Internet reach in India 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).

Both developing and developed communities have responded in different ways to these and other constraining factors to virtual education (discussed later in this chapter). One key response has been to redefine the nature and function of learning venues that enable virtual education.

## The Traditional Nature of Learning Venues

The world is changing rapidly in all areas — in the environment, in the economy, in technology and in education. While it is important to spend time pondering the implications of such change, perhaps it is more important to consider the implications of the changes to education. The education system should be the key platform that enables young people to develop the necessary skills required to prepare for the changing world.

The introduction of ICT to support virtual education has generated a range of discussion, generally focusing on the value of using the technology for this form of education delivery. Often such discussion illustrates a lack of unanimity on the issues that need to be addressed for the effective use of technology to support virtual education. However, there are three issues that seem to generate consensus by all people involved in education: costs, decision-making and access.

The COL study on virtual institutions (Farrell, 1999) noted that the lack of access to learning venues and the lack of access to connectivity and learning technologies within venues was a major constraint, particularly in developing countries. And it is this element of education, the “place” of the educational interaction, that is increasingly being seen as crucial to promoting access to virtual education.

In focusing on learning venues, a range of vital questions should be considered to guide the thinking on the spatial and social construction of such venues. These include:

- What are the implications for learning where students are able to access second opinions and further information to that provided by the textbook and teacher? How can the student access such opinions and information and what technology will best serve this purpose?
- What will the role of the teacher be in the context of different learning venues and environments? When does the teacher become the author, the expert, the tutor, the presenter and the facilitator? What learning space is required to enable the teacher to carry out these tasks?
- Increasingly there is a shift away from a class defined only by age to individually tailored education based on the requirements of each student. Using resource-based methods, institutions are able to cater to different students in terms of their capabilities, potential and stage of learning maturity. What are the implications of this for peer group relations, teachers, tutors and librarians? What are the implications in terms of the nature of the learning venue and its physical construction and its resources?
- Shifting away from mass groups of students to individual learning requires administrative and resource control systems that enable such learning to occur. What are the implications of this type of system for the learning space necessary for the learner to be successful?

(These questions are summarised from the Organisation for Economic Co-operation and Development (OECD, 1994).)

Such questions pose interesting considerations on the nature of the learning structure. The “buildings” may be a school; or part of other

public buildings like libraries, town centres, community centres; or part of private buildings like shops, factories or telecentres. In constructing such “buildings,” issues such as noise, connected and unconnected spaces, electricity and telecommunications, and public and private learning spaces need to be considered.

## The Development of Innovative Learning Venues

The response of many developing and developed countries to ways of increasing access to virtual education has been to redefine the nature of learning sites. There are many terms used to describe these learning sites, including community learning centres, multi-purpose community centres, telecentres and derivations thereof.

### COMMUNITY LEARNING CENTRES

A community learning centre (CLC) is a site where education programmes that are relevant to the needs of the community are made available to the members of the community. These centres are located in different types of buildings (e.g., public buildings, religious buildings, community halls, public schools). The key characteristics of community learning centres are “flexibility, responsiveness to local needs and the creative and efficient use of available resources and infrastructure” (Bester, 2001).

CLCs are often connected to various data sources and networks and use these connections to offer various opportunities such as:

- Offering services and resources based on local education and training needs.
- Providing access to formal and non-formal training and skills development programmes.
- Being a catalyst for communities to make use of their own resources.
- Providing information and communication according to community needs.

- Acting as access points for local and outside resources.
- Providing a base for community development forums (Bester, 2001).

### MULTI-PURPOSE COMMUNITY CENTRES

Another term used to describe learning venues is “multi-purpose community centre” (MPCC). The term “multi-purpose” implies the various sectors that offer services such as information, housing, adult basic education and training, health, culture, small business development, various types of employment, welfare and social interaction (Bester, 2001).

MPCCs are gaining momentum. A single centre that enables the sharing of facilities and resources and that can offer a range of services is proving to be more cost effective and efficient. An MPCC is often seen as a “one-stop shop” that directly meets the education and training needs of both the individual and the broader community.

A further derivative of the multi-purpose community centre is the multi-purpose community learning centre (MPCLC). The MPCLC is seen as that component of the MPCC that is focused on education and training services. An MPCLC delivers multi-sectoral education and training, with formal education at certain times and non-formal at other times. In centres where different technologies are available, various virtual learning opportunities become available.

Note that in all the definitions discussed so far, two words are consistently used: *community* and *centre*. A community is often described as a role-player or stakeholder within a specific locality. These role-players are often organised forms representing specific groups with certain interests. An example of a community is the local residents’ association representing all residents in a geographic area. A centre is the physical entity that houses the resources and technology that enable access to information and learning opportunities.

## TELECENTRES

Of late, a new term, “telecentres,” has been derived to describe a centre that offers various communication services. Telecentres are communal facilities consisting of a physical space that provides public access to ICTs for educational, personal, social and economic uses. The services offered range from basic telephony, fax and e-mail to full Internet connectivity (IICD, 2000).

In their paper on telecentres, Gomez, Hunter and Lamoureux (1999) have developed a typology of telecentres that describe the five different types: basic telecentre, telecentre franchise, civic telecentre, cyber café and multi-purpose community telecentre (MTC).

### Basic telecentres

Basic telecentres are generally small operations that are either privately owned or run by non-governmental organisations (NGOs) as part of their services. The NGO operation is often funded by international donor agencies.

Basic telecentres are usually found in rural, marginalised or peri-urban areas that support poor communities with high levels of illiteracy. They usually offer “a mix of services including telephony, fax, computing, Internet, photocopying and related technologies” (Norton et al., 2000). As well, they often have a small number of computers that use dial-up connections to an Internet service provider (ISP). The key to the success of basic telecentres is that they are linked to the local community they serve and their workers are drawn from the local community.

### Telecentre franchises

Telecentre franchises refer to a number of interconnected telecentres that are independently owned. As they are based on a franchise model, there is a centrally located organisation that facilitates technical and/or financial support.

Telecentre franchises generally have a small number of computers for public access and use

dial-up connections to an ISP. While there is central support, the nature of the services offered differ according to needs of the community that is being served.

- In *Egypt*, three technology access community centres (TACCs) have been established in the delta. They have generated over 3000 community Internet users and trained hundreds of community members to use the Internet. This was done at a cost far less than the commercial cyber cafés.
- *Brazil* offers another example of the telecentre franchise model. At present there are 208 Computer and Citizenship Schools in 17 Brazilian states that have been established by the Centre for the Democratization of Computer Science (Margolis, 2001). These are autonomous and self-sustaining schools that are developing and carrying out a range of activities based on the needs of the different groups that they work with.
- The *Global Distance Learning Network* (GDLN) initiative of the World Bank has established 23 telecentre franchise operations in Africa (Benin, Côte d’Ivoire, Ethiopia, Ghana, Senegal, Tanzania and Uganda); Asia (China, Singapore, Thailand and Vietnam); Europe (France, Spain and Ukraine); Latin America and the Caribbean (Bolivia, Chile, Columbia, Costa Rica, Dominican Republic, Nicaragua and Peru); Middle East and North Africa (Egypt) and North America (U.S.A.) (see [www.worldbank.org/gdln/dlcs.htm](http://www.worldbank.org/gdln/dlcs.htm)). These centres use state-of-the-art technology to promote learning and information sharing. Each centre is run and managed by the institution hosting it and offers courses and capacity-building programmes aimed at government officials, private sector representatives, NGOs, students and others.

While GDLN centres do not fit into the traditional model of telecentres, the services

many of these offer reflect the telecentre functions, albeit at a higher level of technology. GDLN centres are designed to offer full multimedia connectivity and interaction, which runs independent of the local country telecommunications infrastructure. The centres are designed to have one room for live (synchronous) video and data interaction with a second room being used for computer and Internet-based activities. Other rooms are for the network communications equipment, training, administration, etc.

### **Civic telecentres**

Civic telecentres are closest to the multi-purpose community centres (MPCCs) described earlier. They are probably the most common type of centre found in many traditional civic institutions (e.g., public libraries, schools, universities, community organisations that have buildings and community centres). These centres have traditionally offered services to a single group within the community. Recently, there has been a shift to offering multiple services to multiple groups at different times and in different spaces within the centre.

- *Egypt* provides one example of this type of civic telecentre. The Investing in Egypt's Future initiative, launched by the First Lady, Her Excellency Mrs. Susanne Mubark in 1997, focused on developing ICT-empowered libraries. The telecentres follow a business model that was structured to ensure sustainability. They are wired locally and internationally and have two permanent staff who are computer literate. Each centre has a number of PCs as well as a software library and training programmes (Ramzy, 1999).
- In the *U.S.A.*, the Community Technology Centers Network (CTCNet – [www.ctcnet.org](http://www.ctcnet.org)) has assisted in establishing hundreds of telecentres in low-income urban and rural

areas (Murray, Murray and Brooks, 2001). CTCNet brings together agencies and programmes that provide opportunities where people of all ages who lack access to technologies can use them to develop personal skills and self-confidence. The majority of these centres' clients have used them to improve their skills, mainly in computer-related areas, and to find jobs. These organisations support lifelong learning opportunities, especially for people who have had limited and/or negative educational opportunities. Some of these centres are standalone while others operate as part of larger organisations such as museums, libraries, job training centres and shelters. These centres often offer limited services and do not publicise their services outside of the immediate community. Connectivity usually depends on a single dial-up connection, although in some cases there are sophisticated local area networks and dedicated lines.

- In *Mexico*, using electronic media (mainly television) as a pedagogical tool for both basic and adult education was started in 1968 with the development of telesecondary school (see [www.embamexcan.com/english/indexenglish.html](http://www.embamexcan.com/english/indexenglish.html)). The telesecondary school uses a channel from EDUSAT, Mexico's Education Network via Satellite. The EDUSAT signal covers all 32 federal entities and is received in Central America and the southern United States. Each classroom is installed with receiving equipment (an external satellite dish for the school, a decoder for the classroom, and a 27-inch screen television set) that is used primarily for programmes for grades 7, 8 and 9 in junior high school. This service is increasingly being used to support civic and other non-formal education activities.

### **Cyber cafés**

The cyber café model is one that needs further exploration as most are based on a for-profit basis. However, the rapid growth and popularity of cyber cafés, especially in urban areas, is worth noting and exploring ways for their use to support access to virtual education opportunities. Some community-oriented cyber cafés offer preferential rates or services to communities or local organisations while still maintaining their commercial business activities to the general public.

An example of using a cyber café was recently illustrated by Niall McKay (2001) in which he focused on the computer science courses being offered by the Carnegie Mellon University. The courses are being offered worldwide, and in India the point of access is the Internet cafés in Delhi. To offer support to the students, Carnegie Technology Education, a subsidiary of the university, has partnered with Sterling InfoTech, an Indian Internet service provider, and local cyber cafés.

As well, the Senegal government, with the support of a Senegalese private company, has agreed to establish cyber cafés in the Universities of Dakar and Saint-Louis, as well as in public schools. (Pan African News Agency, 2000). The Cheikh Anta Diop University in Dakar will have a cyber café of 100 machines while the University of Gaston Berger of Saint-Louis will have between 40 and 50 machines. Students will access these cyber cafés after paying a one-year user fee of between CFA2500 and 5000 francs. There will also be a surfing fee. Details of this initiative can be found on the Web site: [www.allAfrica.com](http://www.allAfrica.com).

### **Multi-purpose community telecentres**

Multi-purpose community telecentres (MCTs) offer more than basic access to ICT. They “are likely to have higher-end technologies, employ full-time staff, focus on specialised services and train a broad array of users in areas such as health,

education, small business and local governance” (Norton, et al., 2000). Often these centres also offer postal and banking services, and given the high bandwidth requirements of the MCT, most have leased lines or ISDN (integrated services digital network) with a local network connecting the computers. Increasingly these centres are being used for tele-trading, support to small and medium enterprises and vocational training courses.

- In *Brazil*, the pioneers of the MCT “sought to open telecentres based on a multi-purpose model comprised of public service module, tele-office module, business module and educational module” (Murray et al.). The educational module in this case study proved the most important to the success of the centre as it offered the application of technology to support formal education, training and small business development. It also enabled access to distance education courses and influenced formal education teaching by making resources and training available to teachers.
- *The Australian Telecentre Network* (Queensland Open Learning Network, Tasmanian Online Access Centers, Gippsland Centers Network and Western Australia Telecentre Network) was established to enable access to tertiary-level students that were in rural and remote communities. Thus these centres serve as venues through which educational institutions can offer courses and programmes.
- *The Ministry of Education and Training in Vietnam* recently announced that it is building two national distance education centres in Hanoi and Ho Chi Minh City and a regional centre in Hue. These centres, together with the upgraded provincial satellite centres, will provide distance education throughout the country. The centres will be equipped with modern facilities and all computers will be

connected to the national computer system. The initial users of the centres will be teachers, with a needs assessment being done to gauge training demands from other economic sectors and other uses for the centres (Son, 2000).

- In *India*, the MS Swaminathan Research Foundation has partnered with the International Development Research Centre (IDRC) to implement the Information Villages Research Project in the Pondicherry region (see [www.mssrf.org](http://www.mssrf.org)). This project is based on the argument that providing information and adding value to such information is vital to enabling rural families to access it. The project has established value-added centres where staff scans the Internet for information on technologies, health, transport, public events, education, subsidies, prices of local commodities, etc. Thus the value-added centre acts as the hub site and uses VHF radio system for a local area network that connects the hub to village information centres (information shops).

Each shop varies in the way it is operated and supported. One has a village development council; another has a non-formal trust established by the community; a third uses space allocated to it by the locally elected *panchayat*. The shops each have a pentium PC with multimedia software and printers. The PC is connected to the wireless network through a modem. Each shop also has a board to display bulletins and other village information. Given the range of information available via the hub site, various members of the village use the shop for different purposes.

Other examples of such centres can be found in Benin, Mali, Mozambique, South Africa, Tanzania, Uganda, Honduras, Suriname, Bhutan, Pakistan and Philippines.

## TECHNOLOGY NEEDED FOR TELECENTRES

Jensen and Walker (2001) have noted the technology options and requirements for developing telecentres.

- A key technology is telephony services. A telephone system is a vital part of telecentres. Phones need to include audio-conferencing facilities, answering machines and a call accounting system that can note the unit charge of the calls made and, therefore, calculate the costs of the call. Faxes are also important to communications, and telecentres are increasingly able to make use of low-cost Internet-based fax services.
- Computer systems lie at the heart of the telecentre development. The majority of centres have a multi-PC environment with one machine dedicated to administration with the others being available to the general public. Increasingly, many telecentres are using refurbished computers to add to their network.
- Internet access is increasingly becoming the selling point for telecentres. If telephone linkages are unavailable, then standalone computers, TVs and radios are able to provide services to the community. Internet access via dial-up to an Internet service provider (ISP) is often expensive, especially when it requires a long distance call. Therefore many telecentres tend to focus more on e-mail access than Web access.
- When more than one PC is being used, they can be linked together via cables into a local area network (LAN). Wireless LANs are becoming popular as they allow for expanding the networks to other buildings without the need for cabling.
- Some centres also have community radio stations that offer valuable information and

support to education, health and community development.

Other technology requirements include printers, modems, video-conferencing and various software for training, education and communications. Other equipment generally found in better resourced telecentres include photocopiers, binding machines, CD writers, scanners, laminators, paper shredders, cameras, VCRs, audio cassettes, and projection equipment.

## Driving and Constraining Forces of Learning Venues

### DRIVING FORCES

Clearly the need for education and training is the main driving force for the development of innovative learning venues. As noted earlier, there has been a massive increase in the number of students enrolled in various sectors of the education and training 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 learning venues. 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 (News Update, Jan. 2001).

With the drive for learning comes the need for individually tailored education that notes a person's capability, potential and level of maturity in terms of his or her own learning progress. This need for individually tailored education has been helped by the development of resource-based learning, distance education and, more recently, the creation of learning objects for content aggregation. Enabling the individual learner to access education opportunities using ICT has ensured that there is an emerging market for education. This in turn has driven the development of innovative access points to learning opportunities.

Access is not only about hardware and software; it is about creating an environment which 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 also act as a constraining force. 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, for keeping the Web site updated and for 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 which 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 the costs.
- The successful use of multi-purpose centres for virtual education relies on trained and professional support. Often learners 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 are familiar with teaching and support in an online environment. This situation poses a threat to being able to deliver online learning as well as to the development of online courses that are context-specific to a country or region.
- A further concern is about the quality of the degrees being earned online. The American Federation of Teachers, which represents more than one million teachers, does not believe that “an online degree equals the same degree as one where someone is meeting with other students and professors” (Wilfong, 2000). This opinion illustrates the need for trained and professional support at the access points to ensure that the quality of support for online degrees and other courses increases the quality of those degrees and courses.

## Major Considerations for the Development of Learning Venues

Having noted the poor levels of connectivity in many developing countries and the development of multi-purpose telecentres as one strategy to promote the use of ICT for general and educational applications, one needs to consider the key issues in the development of learning venues to support virtual education. The four major considerations that need to be addressed if learning venues are to support virtual education are planning, management, education application and learner support.

### PLANNING

The establishment of multi-purpose centres requires careful planning that needs to involve the major role-players in the community. Such planning should focus on the aims and objectives of the centre in terms of the services it wishes to provide. To plan effectively, it is necessary to conduct an internal and external environmental scan.

The internal scan should focus on internal practices to identify the strengths and weaknesses of the centre and the technological infrastructure required. The external scan should note the various factors that would support or hinder the centre. Some of these would include possible partners in terms of content, technical support and education institutions; organised user or client groups within the community; government (local, regional and national); local businesses and the recreational needs of the surrounding community. This scan is crucial to determine the programmes that could be offered, to ensure that the centre is able to meet the needs being expressed by the community it is serving and to enable it to become economically self-sustaining.

The last issue, sustainability, is vital. Often these centres have been established by government

departments, private sector organisations, development agencies, non-governmental organisations or a combination of these entities. A centre's ability to become self-sustaining over a period of time depends on the services they offered and whether education is one of major services.

A number of key issues have an impact on sustainability and need to be factored into the planning process. The following is a summary of some of the key issues that have been identified by Norton, et al. (2000).

- Clearly there needs to be a combination of local ownership and management with external investment. The franchised-based model for the multi-purpose centre offers the best option to enable sustainability. It allows for outside seed money, bulk services and rates, training, equipment and technical assistance to be provided to the centre.
- The centre needs to be located in an area that has a relatively dense population with a strong small and micro-enterprise (SME) platform to enable it to be sustainable. If such centres are linked to existing institutions of good standing within the community, then the chances of being successful and sustained are greater.
- The centre must meet real needs and develop specific content for local communities. The need for relevant, accurate information that can be applied to different sectors (education, health, small business, agriculture, community development) ensures that the users identify with the centre and the relevance of the services being offered. This approach displays a demand-driven list of services that meet needs.
- The quality and commitment of the management and staff is vital. Training of a technical nature, personnel, financial and marketing is necessary to the success of the centre. A centre that offers a broader range

of fee-for-use services to the local community is likely to generate revenue that could be used to cross-subsidise other services that are not revenue-generating.

- While there is great value to offering a wide range of services and functions, this approach can also lead to the centre management and staff not having the skills and being unable to cope with the strategic planning and management required.

## MANAGEMENT

Elmer (quoted in Murray, Murray and Brooks, 2001) notes that “the community-based telecentre model under experimentation in a number of developing countries may well represent a new organisational form for delivering quality educational services on a more equitable and cost-effective basis.” Given the experimental nature of telecentres, their success is based on good management that interprets the mission, aims and objectives into deliverable programmes, projects and services that meet the needs and priorities of the clients and community. In this context, managing the planning process, staffing structure, recruitment and responsibility, financial management, quality assurance of the services being offered, administration and governance of the centre are important management issues.

Managing any centre should also include external components that include advocacy in terms of stating what the centre offers, providing information to client groups, marketing the services, assessing new needs of the various client groups and facilitating collaborative relationships with various institutions, both public and private, non-governmental and community-based organisations.

The manager and staff need to understand the above requirements for a successful centre. All staff members should be able to clearly articulate the focus of the centre and display a high

degree of skills and attitude that meets the needs of the client group and encourages them to visit the centre and use its facilities.

Murray, Murray and Brooks (2001) suggest that computer skills, together with strong management skills, are necessary prerequisites to making a telecentre work. Thus, training is a vital part for the development of any centre and should include management and other necessary skills. They list the following as possible key training components:

- Communication and development.
- The role of telecentres in development.
- The role of the telecentre manager.
- Business and financial skills.
- Needs assessment skills and evaluation (research) methods.
- Training skills.
- Human resource management.
- Marketing and public relations skills.
- Communication and development.
- Basic computer skills.
- Information production skills (Murray et al., 2001).

There are already a variety of course materials available in these areas for training.

## EDUCATION APPLICATION

In many ways, predicting the nature of the learning venue that is designed to support a single mode of learning will render such a building obsolete. Such learning venues need to consciously cater to multiple technologies and different learning styles if they are to be successful and inspirational.

The physical nature of learning venues is likely to be an issue to accessing virtual education. While noting the changes in technological and educational trends, the question of “whether the concept of a school as a single-use building occupied for only part of the day by an age-defined

group of people” will not be entertained (OECD Report, 1994). It is clear that given the economic pressures, access pressures, the changing nature of the learning and teaching process and the developments in the technology, there will be a multiplicity of uses across different age groups and different types of education needs will be met.

In determining such venues for a multiplicity of uses, it is important to ensure that all learning forms are catered to, including individual learning using different technologies as well as space to encourage collaborative work. The main technologies need to include telecommunications, computers (most likely to be data networks), electrical power from different sources (gas, solar, hydro) and broadcasting (radio and TV).

Understanding the educational applications within the physical learning venue is important. One of the most obvious strengths of the technology is its ability to offer up-to-date resources and information to a large number of learners, teachers and administrators immediately, easily and relatively cheaply. Using Internet technologies, the following applications become possible:

- “Supporting the use of resources that combine more than one medium, namely multimedia resources, which combines video, audio, graphics and text, and have the potential of providing rich learning experiences” (Bester, 2001).
- “Bringing designers of online learning resources in contact with the huge resources base that resides on the World Wide Web. This in itself is said to be of negligible educational value, but if harnessed effectively by educators, could become a useful resource” (Bester, 2001).
- Supporting a range of communication strategies between the learner and teacher, between learners and between teachers. Such communication could be asynchronous or synchronous.

- Ensuring that the technology supports and creates efficient management and administration systems within the education system.

## LEARNER SUPPORT

Perraton (2000) notes that one feature of using technology for education and training is student support services of various kinds. This requirement has both organisational and costs implications and is often labour intensive, even when using different technologies. It follows that learner support is an important consideration when implementing virtual education interventions. Several types of support should be made available to learners. Bester (2001) notes four types:

- Support of all kinds on a regular basis offered by educators both through face-to-face contact and other forms of communication (including telephones, the post and computer links).
- Interaction between learners on both a group and on a one-to-one basis.
- Provision of any necessary learner support in educational courses.
- Provision of access to the necessary facilities, including a space in which learning activities and interaction between learners can take place, as well as access to computers, laboratories and other resources that might be necessary within the learning process.

A fifth type of support necessary for centres to consider when supporting virtual education is easy access to administration procedures that are necessary when registering and paying for courses and when needing to enquire on matters.

## Conclusion

The rapid development of virtual education has brought to the fore different challenges to the provision of education and training. The delivery of virtual education, that is the provision of

an educational transaction for a formal certificate or for non-formal purposes, has shown tremendous growth and is likely to increase as the demand for education and training grows.

However, this growth and projected increased demand has been and is likely to be uneven with the developed world being able to fully exploit the advantages of virtual education. The developing world, with its difficulties in education systems, education processes and practices, infrastructure, telecommunications infrastructure, lack of ICT infrastructure, etc. will constantly find itself at the lower end of usage of virtual education.

To encourage access, the development of innovative learning centres (community learning centres, telecentres, multi-purpose community learning centres) has been occurring. Such developments have been experimental in nature and driven in large part by development agencies and the private sector. These centres face crucial challenges in terms of their sustainability, their effective management and meeting their target group's needs.

Despite these challenges, such centres offer access to learners of various virtual education opportunities. The development of these centres need to be encouraged and supported if they are to be effective in ensuring that more learners are able to take advantage of virtual education opportunities.

The development of a learning/multi-purpose centre requires certain issues to be addressed and structures to be in place:

- The physical location of the centre needs to be in a community to enable easy access for users.
- The start-up process must ensure that there is a clear understanding of what the centre is going to do and the needs that it will be meeting.

- The mission must be clear and focus on identified needs that are being expressed by the various user groups within the community.
- The structure of the centre in terms of its organisational requirements (including staff, management structures and procedures, financial systems, etc.) and infrastructure (including the appropriate ICT) must meet the varied needs of the community.
- Community support must be achieved through a mixture of assessing needs, marketing the services and functions, working with community structures and involving such structures in the governance of the centre.
- Appropriate links and partnerships with different service providers must be created. These should include education and training institutions, various NGOs, small and micro enterprises, all levels of government, etc.
- Needed services and functions must be delivered. Such services and functions need to meet the needs of the community being served as well as the internal needs of the centre. (Internal needs include management training, financial and resource management, evaluation and ongoing needs assessment.)

However, such centres should not be seen as the only means to enabling access to virtual education and training. Clearly these centres need to be encouraged as part of a series of strategies that encourage learners to access virtual education, including learning in the home, work place and elsewhere. The need for economic growth and community development is vital so that poorer people and learners have the means to participate in virtual education courses and programmes.

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## WEB RESOURCES

[www.ctcnet.org](http://www.ctcnet.org) — A U.S.-based national non-profit membership organisation of 500 independent community technology centres where people get free or low-cost access to computers, the Internet and course.

[www.embamexcan.com/english/indexenglish.html](http://www.embamexcan.com/english/indexenglish.html) — The home page for the Embassy of Mexico in Canada. Link to the education menu for information on the telesecondary schools.

[www.kabissa.org](http://www.kabissa.org) — A site for African non-profit organisations to use the Internet to strengthen capacity and build civil society and democracy in Africa.

[www.mssrf.org](http://www.mssrf.org) — The site for MS Swaminathan Research Foundation which is committed to harnessing science and technology for environmentally sustainable and socially equitable development.

[www.worldbank.org/gdln/dlcs.htm](http://www.worldbank.org/gdln/dlcs.htm) — The Global Distance Learning Network is designed to bring decision-makers in the developing world together into a global network of peers, experts and practitioners to share ideas, experiences and expertise using an interactive multi-channel network.

[www.iicd.org/models/telecentres/index.html](http://www.iicd.org/models/telecentres/index.html) — Information on telecentres from the International Institute for Communication and Development (IICD).