MODULE: 5a) Accessibility and Selection of DE Media
CONTRIBUTORS TO THIS SECTION: Gihan Wikramanayake, University of Colombo, Sri Lanka; Jon Baggaley, PANdora project advisor
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This section focuses on the problems of Internet accessibility in distance education. It emphasises the problems facing distance educators and students in South Asia, and the findings of an extensive (2005-07) study of the accessibility, acceptance and effects of DE in Bhutan, Pakistan, and Sri Lanka, reported by the PANdora DE research network.

In all parts of the world, information and communications technologies (ICT) are considered vital for economic growth, and students are expected to have access to global knowledge resources, often via distance education (DE) methods. In North America, Europe and Australia, the most commonly used medium for delivering DE courses is now the Internet and World-Wide Web (WWW). Since the 1990s, universities and colleges in developing countries, notably across Asia, have followed this example by converting their course materials into web-based formats and developing new online courses (Gunawardena, 1995). The adoptability and-cost effectiveness of ICT-based learning models in developing countries is not yet fully validated, however, and studies are indicating that the selection of the WWW as a medium for Asian education may actually be premature, owing to its inaccessibility to large proportions of the population.

Recent studies by the PANdora network of Asian DE researchers have confirmed this conclusion (Baggaley & Belawati, 2007). The PANdora network is sponsored by the IDRC's PAN Asia Networking Division, and comprises two dozen educators and researchers in 14 Asian countries. A PANdora study of access to DE technologies in South Asia (Samaranayake *et al*., 2007) shows that at present most students use computers, though only a minority has Internet access. In Sri Lanka, 79% use non-Internet computers in their educational institution; 42% of them have online access at home, and 35% use Internet kiosks. In Pakistan, location of the world's largest university (AIOU), the access figures are lower in all categories, with institutional computers (no Internet) used by 42% of the students, and facilities such as e-mail, web-based training material, and text-chat accessed by 15 - 30%. The geographical coverage of many Internet service providers in the region does not include rural areas. Higher proportions of South Asian students have access to other media (e.g. radio and television), and these are used as major media of educational delivery by most of the large South Asian universities. E-learning approaches are proving more successful in India than elsewhere, though mainly in the corporate sector where access is more readily available.

In Bhutan, only 35% of students surveyed reported that they had easy access to a computer, either in the workplace, at home, or in Internet kiosks (Jamtsho & Bullen, 2007). After taking an e-learning option offered in 2005 for teacher training credit, relatively few students were satisfied with the experience. Eighty-three percent reported difficulty in using the online method owing to poor Internet connections (22%); not enough time (22%); too complicated to use (22%); and having to travel too far to get Internet access (33%). During the course as a whole, 66% said they had used the e-learning option less than once a month. Following intensive preparations involving the creation of a comprehensive LMS using *Moodle*™, the development team described their numerous implementation obstacles, relating to lack of technical support and national ICT infrastructure, need for faculty training, and faculty resistance to e-learning generally. In countries including Indonesia, Laos, Mongolia, and Thailand, e-learning efforts are at a much earlier stage of development, and the same issues are proving to be serious obstacles to progress (Baggaley & Belawati, 2007).

Those that do have Internet access report numerous other problems. For example, Jamtsho (in Jamtsho & Bullen, 2007), describes the Royal University of Bhutan's attempts to use the WWW in online DE:

> (February 2007): I have to admit that (Internet) access is still our main concern. After one hour, I still couldn't send one email…(For web use) we had *Moodle* ™ installed on our server at Samtse, but then lightning struck and we were down for over a month. Then the suggestion from the techies was to have Druknet [the ISP] host it. Even after moving it there, it went down on a number of occasions. It always took numerous requests to have it up and running but almost always with some problems… So we decided to explore possibilities of hosting it elsewhere where we may receive better support and service. However, we have not been very successful so far. I do suspect that we are quite far from achieving the ideal situation that many seem to expect almost immediately after we introduce something new…

Similar problems have been reported by PANdora researchers in Indonesia and Thailand, who have concluded that Asian institutions are selecting "e-learning methods as a major symbol of their modernisation", rather than as the result of research and evaluation into e-learning accessibility (Hardhono *et al*., 2007). This team's analysis of attitudes to web-based learning materials repositories in Asia indicates the need for improvements in policy and infrastructure before teachers and students can make optimal use of WWW techniques. The same conclusions have been drawn by numerous earlier studies (Gulati, 2008).

A collaborative study by members of 14 Asian countries of the entire PANdora network has provided data about the reasons for the Internet's inaccessibility in the region (Baggaley *et al*., 2007). The study has measured the time taken to access web pages between major Asian cities, and has reported that "In most of the survey conditions, browser loading times were noted up to four times slower than commonly prescribed as acceptable. Failure of pages to load at all was frequent…" Using the widely available 'traceroute' routine, the study also analysed the routes taken by web hits (attempts to access material) from web servers at Asian institutions. All web hits go through intermediate web servers before reaching their target, and the more intermediate 'hops' involved, the greater the chance that the access attempt will be unsuccessful. Whereas Canadian hits on Canadian web servers users may go through half a dozen hops, web hits by users in Asia commonly go through 20 or more hops, failing to reach their target altogether. The study has recommended the development of more efficient mirror sites and Internet Exchange Points (IXPs) for Asian online learning.

The next sub-section presents the conclusions of the comprehensive recent study on this topic, in Bhutan, Pakistan and Sri Lanka (Samaranayake *et al*., 2007).

Online accessibility and acceptance in South Asia

1. Accessibility. The survey by Samaranayake *et al*. (2007) has highlighted the increased use of computers and ICT in Bhutan, Pakistan, and Sri Lanka since the 1990s, and the dramatic increase in computer usage for education. Government policy for tax-free computers has placed them within the reach of middle-class users, and widespread access to used computers has made it possible for many families to afford a computer at home. The survey has revealed that students are ready and willing to embrace ICT-based learning methods, and that in all three countries, the main location for student access to computers is the study institution. As indicated above, computer access is relatively high in Sri Lanka, where more than two-thirds of students gain access through their study institutions. In Bhutan and Pakistan, less than half the students have computer access. In the three countries, their main location for Internet access is at their study institutions. In Pakistan and in Sri Lanka, Internet access is mostly at the student's place of study/ work, and the use of Internet cafes is relatively unpopular, in part owing to their slow-dial-up connectivity and serious computer virus problems. Most students complain that the Internet is usually disconnected before they can download the large multimedia files necessary for their online work. In all three countries, ICT-based learning resources are used in study programmes. In over 90% of the courses, however, their use is partial and the students' ability to use interactive learning materials is minimal.

2. Affordability. The Samaranayake study also indicates that the high cost of Internet usage is a problem for many students, though the majority of them feels that ICT-based resources are generally affordable, usually with the financial assistance of their parents. Considering the high cost of connectivity relative to local salaries, this attitude indicates the high priority given to education by students and parents alike. Thus, accessibility and availability are the major obstacles to online learning rather than affordability.

3. Models suitable for different countries. The same study has considered the alternatives to online methods of DE: e.g. use of computer-assisted learning resources, TV, radio, cell-phone, and other audiovisual resources. The general availability of non-Internet ICT-based resources seems satisfactory in educational institutions as well as in students' homes. Multimedia CDs are an effective way for students to learn, though their quality is not always good; and electricity service problems in rural areas, economic factors, and the lack of learning content in local languages, hinder wide accessibility and acceptance of ICTs generally. The use of mixed-media ('blended') methods for DE is encouraged in such areas, and is becoming increasingly important in all types of education. The Sri Lanka and Pakistan samples in the Samaranayake study have indicated that mixed-media delivery modes of this type are most suited to their needs. The study recommends more extensive use of radio and TV, widely and freely available in most Asian countries, and the establishment of nationwide educational radio and TV services. Public infrastructures need to catch up with demand and to increase nationwide coverage. Neither the public nor the private sectors tend to be involved in such initiatives, however, mainly owing to lack of funding. If DE is to be widely adopted as a means of increasing educational access in Asia, such initiatives will be a major investment for future generations.

Recommendations

Most students feel that ICT-based learning offers them significant benefits, saving time and helping them to learn more efficiently, to understand concepts/theories, to find relevant information easily, and to make the educational process more interesting. A high proportion of the population in this region lives below the poverty level, however, and cannot afford the resources necessary for ICT-based study. Educational institutions lack resources (equipment and operational maintenance), and accessibility and reliability are of low quality at national levels. The educational practices and policies of present and past governments in the region have recognised the value of education in social development, and have provided systems of free education at school level. The availability of tertiary education is restricted, however, owing to lack of the resources needed to make it available for all.

The environment of education in Asia is gradually changing, however. The traditional, exclusively teacher-focused environment is giving way to student-centred learning environments as various ICT technologies are integrated into the system. The skills for using ICT resources are provided in schools both to teachers and students. While access is an immediate challenge to be dealt with, there are positive signs that a culture of ICT usage for study purpose is developing in the region, and needs to be more systematically promoted. Public awareness of the advantages of ICT and DE methods needs to be increased, in order to encourage future investment in easy and affordable educational access both at home and at the place of work/study. For students who lack their own domestic resources, it is important that access is provided within easy reach of their homes: e.g., at telecentres. Sri Lanka, for example, is beginning to take the benefits of ICT to rural communities through various models of multi-purpose community telecentre; and a nationwide broadband backbone is under development by the telecommunication companies to make maximum use of ICT-based resources. Ultimately, governments need to come to the rescue with infrastructure building, teacher training, and content development for all ethnic religious and social communities, and for both genders on an equal basis. This can be achieved through the adoption of appropriate ICT-based methods for different student groups.

Conclusions

The modern focus on online education in developing countries seems to have failed to take account of its general lack of accessibility. In order to appear 'modern', Asian distance educators are embracing first-world, Internet-based methods that do not work well elsewhere. It is possible that developing countries will unwisely follow the example of 1st-world educational institutions in abandoning traditional media such as radio and television, even though these technologies are more widely accessible than the Internet and World-Wide Web in all parts of the world. Meanwhile, studies of accessibility and acceptance can generate useful conclusions for educational policy-makers in relation to the design of mirror sites and new Internet routings across the developing world. ICTs, particularly computer-based, have become an integral part of every aspect of life, and it is imperative for schools to have easy access to them, not just for learning but as a preparation for life. While waiting for improved access to modern ICT facilities such as computers and the Internet, there is clear scope for extensive uses of the radio, TV, and cell-phone media that are freely available in all parts of South Asia.

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