



Distance Education: Growth and Diversity

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Distance education is becoming increasingly popular as economic forces encourage, and new technologies facilitate, its spread. What advantages does it offer, and what should course providers consider before embarking on new ventures?

THERE IS tremendous growth and diversity in distance education—in the number and types of individuals learning outside traditional classrooms, in the variety of providers, and in the range and effectiveness of new technologies serving as delivery tools for learning. Distance education is becoming increasingly global, creating myriad new alliances as traditional educational institutions join with businesses, foreign governments, and international organizations to offer and use distance learning. Developing countries now have new opportunities to access knowledge and enhance their human capital.

Technology is a major contributor to the dramatic transformation of distance learning. Although the use of technology for distance learning is not new—radio and

television have been used effectively for more than forty years—satellites and the Internet are transforming the world into a borderless educational arena, benefiting both previously underserved citizenries and education entrepreneurs. Although many developing countries still have limited access to these new technologies, major new investments in telecommunications and information systems are going to dramatically improve their access.

Uses and purposes

Distance education is used in a variety of settings and for a broad range of purposes. Universities use it to increase the number of students who have access to higher education; companies use it to upgrade their workers' skills and keep them abreast of rapidly advancing technologies; individuals use it for their own professional development and to enhance their career opportunities; governments use it to provide on-the-job training to teachers or other workers, to enhance the quality of traditional primary and secondary schooling, and to deliver instruction to remote rural areas that might not otherwise be served.

Various technologies have been used for distance education, but print-based correspondence courses have been, and will continue to be, the dominant delivery mechanism in both the developed and the developing worlds. Print is still the cheapest technology, and, even if the costs of using high-tech dissemination tools fall below

those of print, it will be some time before many countries have adequate infrastructures.

Higher education. Within the university setting, some institutions offer *only* distance education, while others provide *both* distance and conventional education. Those that offer only distance learning are referred to as "open universities," and most are modeled after the United Kingdom's Open University. Mega-universities are large open universities, each of which enrolls more than 100,000 students per year; combined enrollment is some 2.8 million. Table 1 shows the 11 mega-universities, most of which have been established within the past 20 years in an effort to meet the pent-up demand for higher education. China alone produces more than 100,000 graduates a year through distance education, with more than half of China's 92,000 engineering and technology graduates having attained their degrees through distance education.

Although many conventional universities also have offered distance learning opportunities for some time, many others are just now beginning to experiment with them, in large part because they are unable to meet the increasing demand for higher education. Even some elite universities that would not previously have considered getting involved in distance education are cautiously entering the arena. For example, Johns Hopkins University in the United States offers a managed care course, using video and computer technology, as part of

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its "Business of Medicine" certificate program. Duke University offers a Global Executive MBA (master's degree in business administration), an \$82,500 course, to students in Europe, Asia, and Latin America using technology that permits them to communicate and do course work. The possibility of attracting students from overseas is one incentive for these institutions to offer distance education programs.

Virtual universities. Entirely new structures are being created to take advantage of the Internet and other technologies to increase access to and improve the quality of higher education. For example, virtual universities—universities without walls that use the Internet and satellites to deliver their courses—allow teaching resources, libraries, and even laboratories to be shared by people and organizations in widely scattered places.

Launched in 1989, the Virtual University of the Monterrey Institute of Technology in Mexico is a consortium of collaborating universities, including 13 outside Mexico. It enrolls 9,000 degree students and an additional 35,000 nondegree participants annually from throughout Mexico and several Latin American countries. Courses are delivered through a combination of printed texts and both live and prerecorded television broadcasts, with communication between faculty and students facilitated by computers.

With World Bank support, a virtual university also has been established for Africa. This venture was motivated by the exceptionally low enrollments, lack of educational materials, outmoded programs, and virtually nonexistent levels of research in Africa's universities.

Most recently, the governors of 10 western U.S. states have launched a virtual university that will allow students to earn degrees by taking courses on-line. This venture was encouraged by a boom in enrollment that the states' governors do not expect to be able to meet by adding traditional colleges and universities.

Learning on the job. A growing number of companies are using distance education as a cost-effective way to provide professional upgrading for their employees. For example, Hewlett-Packard has established a high-tech teaching facility that provides television broadcasts to its employees at more than 100 sites in Europe and the United States. Other companies, however, are turning to external organizations, such as the U.S.-based National Technological University, to provide professional development for their employees. In addition, many

individuals pursue degrees or professional development on their own from their homes—a trend that will increase as more individuals gain access to the Internet.

Teacher training. Teacher upgrading is a major application of distance education, particularly in developing countries where large numbers of teachers are either untrained or undertrained. In such countries, teacher training using distance education is a top priority for the World Bank. Although most distance education for teachers is provided through print and aimed at practicing teachers, some countries or school systems are making use of technology-based distance training.

Extending classrooms. Distance education is often used to enhance the quality of traditional primary and secondary schooling and to deliver instruction to students in remote rural areas. Probably the best-known example of distance learning aimed at children is Sesame Street, produced by the Children's Television Workshop in New York.

In many countries, children living in remote rural areas do not have access to the full complement of course work offered to their peers in more populated areas. For example, Mexico's *Telesecundaria* program has successfully used television to provide more than 700,000 students in small, remote villages with a middle school education.

One-way radio has been widely used to improve educational quality since the early 1970s, particularly in Africa, Asia, and Latin America. Because of the generally low cost and wide availability of radios—even in remote rural areas—this technology is second to print in both economy and extent of use in distance education. Interactive radio instruction (IRI) uses one-way radio to deliver activity-based learning and involves having the "radio teacher" communicate the lesson, integrating the lecture with activities that have students answer questions, sing songs, and do practical tasks. These activities occur during carefully timed pauses, with the classroom teacher serving as the facilitator. IRI programs are generally used to supplement instruction provided by classroom teachers who have inadequate training and limited learning resources.

Is it effective?

As distance education extends its reach and uses new delivery tools, concerns about its effectiveness will only increase. Distance education programs still lack credibility in many countries, and students taking such courses often experience difficulty in

obtaining recognition for their work. Even the highly esteemed U.K. Open University had difficulty in providing unequivocal evidence of the quality of its programs until these were actually compared with courses offered by conventional higher education institutions in the United Kingdom: programs in 6 of the Open University's 11 subject areas were awarded "excellent" ratings. Does distance education really work? Is it just as effective as conventional education? The answer to both questions is yes.

Achievement. Numerous studies have been conducted assessing the effectiveness of distance education, although they have yet to be conducted on Internet-based training or on the benefits of on-line communication with students. More than 70 years of research on print-based correspondence courses has consistently documented their effectiveness compared with courses taught in conventional classroom settings. Most studies of radio instruction show that students benefit from radio learning and that the benefits increase the longer it is used. Research on the use of prepackaged computer-based training for adults across a broad range of settings has consistently found that those who learned at a distance on computers learned as well as or better than those who learned in traditional classrooms, and in some cases the former learned both faster and at substantially lower cost than the latter (Capper, 1990).

Completion. Although research has found that distance students learn as much as conventional students, studies of correspondence students have found that they are much more likely to drop out before completing their courses, with dropout rates ranging from 19 to 90 percent and an overall rate of 40 percent. While similar studies have yet to be conducted for technology-based distance learning, both intuition and the limited research already done suggest that the interactivity and novelty provided by most technology-based approaches may contribute to higher completion rates. High dropout rates are typically attributed to some students' sense of isolation when they study without peer or instructor interaction, insufficient self-discipline, or loss of interest or discouragement owing to the slow feedback they receive in the form of graded assignments. Other reasons include competing demands of jobs and family life.

Ensuring quality

The quality of some distance education programs and institutions is perceived to be poor, with their deficiencies often attributable to inadequate planning and the

Table 1
Mega-universities: Basic data

Name of institution	Established	Students in degree programs	Graduates per year	Budget (million dollars)	Percentage of budget from		Unit cost ²	
					Student fees	Government grants		
China	China TV University System	1979	530,000	101,000	1.2 ³	0	75	40
France	Centre national d'enseignement à distance	1939	184,614	28,000	56	60	30	50
India	Indira Gandhi National Open University	1985	242,000	9,250	10	42	58	35
Indonesia	Universitas Terbuka	1984	353,000	28,000	21	70	30	15
Iran	Payame Noor University	1987	117,000	7,563	13.3	87	13	25
Korea	Korea National Open University	1982	210,578	11,000	79	64	36	5
South Africa	University of South Africa	1873	130,000	10,000	128	39	60	50
Spain	Universidad Nacional de Educación a Distancia	1972	110,000	2,753	129	60	40	40
Thailand	Sukhothai Thammathirat Open University	1978	216,800	12,583	46	73.5	26.5	30
Turkey	Anadolu University	1982	577,804	26,321	30 ⁴	76	6	10
United Kingdom	Open University	1969	157,450	18,359	300	31	60	50

Source: Adapted from J.S. Daniel, 1996, *Mega Universities and Knowledge Media: Technology Strategies for Higher Education* (London: Kogan Page).

¹ Enrollment figures vary by year between 1994 and 1996.

² Unit cost per student as an approximate percentage of the average cost per student for other universities in the country.

³ Central unit only.

⁴ Open Education Faculty only.

use of superficial materials delivered in a piecemeal fashion. Moreover, some inferior programs give more attention to technology issues than to more important curriculum and learner-support issues.

Learner support. Distance learning differs from conventional learning primarily in the isolation and the greater self-discipline required of its students. Because of these characteristics, ensuring that distance learning systems provide adequate support to, and interaction with, students is crucial. Currently, the type and extent of support provided to distance learners varies widely, with the United Kingdom's Open University being notable for both the extent and quality of its learner support. The Virtual University of the Monterrey Institute of Technology assigns one full-time professor for each course and an assistant for every 50 students enrolled in the course.

The variability is due in large part to the increased costs associated with providing support, which cause institutions more concerned with generating income to provide less support than is needed by students. In an attempt to counteract high dropout rates, much of the research in distance education now is focused on identifying the causes of noncompletion and effective strategies for reducing dropouts.

Cost effectiveness

Although distance education programs are reputed to be more cost effective than conventional programs, studies show this is true only if and when enrollments reach sufficiently high levels relative to expenditures and completion rates. A number of

studies have established the cost effectiveness of the mega-universities, with unit costs per student ranging between 5 and 50 percent of the average for other universities in the country (Table 1 and Daniel, 1996). In most of these countries, however, more than 50 percent of the budget is derived from student fees, with this proportion ranging from 87 percent at Iran's Payame Noor University to 0 percent in China's TV University System. Distance education's cost effectiveness becomes evident when one compares the numbers of enrollees and costs per student of the mega-universities with those for conventional universities in the United States. The 3,500 U.S. colleges and universities collectively serve 14 million students at an average annual cost of \$12,500 each. By contrast, the 11 mega-universities serve 2.8 million distance students at an average annual cost of only \$350 each (Daniel, 1996). Since course completion rates for distance education are much lower than in conventional universities, however, the annual cost per student completing courses is apt to be higher than the \$350 cited by Daniel.

The two major factors that influence the cost effectiveness of distance programs are the number of students enrolled and the extent of support provided to students. The higher the number of students enrolled, the lower the per-student costs per course, although this ratio works in reverse for per-student costs of providing student support services, which increase with enrollments. Offering a limited number of courses also helps to keep costs low, since course development often is considerably more expensive for distance education than for

traditional courses. For example, the Open University invests up to three years and as much as £1 million to produce a new course, with design teams consisting of a team manager, content specialists, designers, and production specialists. Several of the mega-universities acknowledge quality problems, however, and in some of them, students complain that learning materials do not teach the relevant subjects well.

Print, audiocassettes, and prerecorded instructional television (lectures) are the lowest-cost technologies for small numbers of students (fewer than 250), while radio requires 1,000 students or more to achieve comparable per-student costs. Computer conferencing is a low-cost approach to providing interactivity between teachers and students, but live interactive broadcasts and video conferencing are still very high-cost technologies, regardless of the number of students enrolled (Table 2).

Trends and challenges

Although distance education has been around for more than two hundred years and has been shown to be effective in a variety of settings, the introduction of technology and its application across global boundaries introduces new trends, issues, and challenges. How, for example, does one judge the quality of a degree earned over the Internet? When should technology be used? And which technology is best? Should countries use programs offered by foreign institutions rather than developing their own? These and many other questions are confronting education policymakers and practitioners around the world. Careful analysis, evaluation, and research will be needed.

Table 2
Average cost per number of students for each distance education technology

	Number of students per annum				
	50	125	250 (dollars)	625	1,250
One-way technologies					
Print ¹	—	2.61	—	0.63	0.37
Audiocassettes ¹	—	3.51	—	1.30	1.02
Prerecorded instructional television (hypothetical)					
25 courses	7.71	3.09	1.54	0.61	0.31
10 courses	7.95	3.18	1.59	0.63	0.31
1 course	18.76	7.50	3.39	1.50	0.75
Radio ¹	—	14.88	—	2.97	1.48
Educational broadcast TV ¹	—	109.87	—	21.97	10.99
Computer-based learning ²					
Low end	59.25	18.75	11.25	6.75	4.50
High end	322.50	130.50	66.75	28.50	15.75
Two-way technologies					
Audio conferencing (Open Learning Agency, Canada)	—	7.12	—	4.11	3.67
Live, interactive lectures (hypothetical)	—	67.24	50.14	34.36	29.00
Video conferencing ³					
384 kilobits per second	56.74	22.17	16.78	14.19	14.19
Computer conferencing (hypothetical)					
Dual-mode					
Institution	1.45	1.12	1.09	0.99	0.93
Student	0.69	0.69	0.69	0.69	0.69
Combined	2.25	1.81	1.80	1.69	1.68

Source: Anthony W. Bates, 1995, *Technology, Open Learning and Distance Education* (London: Routledge).

— Indicates data were not available.

¹ United Kingdom's Open University.

² Data drawn from Ann Stahmer and L. Green, 1993, *Analysing Costs/Benefits of Training Technologies: Some Guidelines* (Toronto: The Training Technology Monitor).

³ Data drawn from Anthony W. Bates, 1994, *Broadcasting in Education* (London: Constable).

Globalization, accreditation, and competition. Employers and universities are now drawing both staff members and students from all corners of the globe. Consequently, they face new challenges in evaluating course work done at, and degrees earned from, unknown institutions in other countries. While accreditation has typically been controlled by individual countries, the globalization of distance education has created a whole new challenge in accreditation and certification of learning. For example, the Global Alliance for Transnational Education (GATE) has been formed to carry out the formidable task of creating a global certification and review process for education delivered across borders.

Globalization raises other issues for countries. For example, instructional programs broadcast from abroad have heightened fears about the contamination of cultures and values. Competition between local and foreign education providers is another issue. While competition is usually good for the consumer, in that it often raises quality and reduces prices, local institutions typically resist foreign competition and, in some countries, are trying to block outsiders from operating in local markets.

Quality and effectiveness. Some developing countries are reluctant to adopt programs originating elsewhere, despite their reputed quality, choosing instead to develop their own; unfortunately, many lack the expertise needed to produce high-quality materials and support structures. Considerable time and expense are required to produce quality programs, and countries with limited resources may put programs together that are inadequate.

Technology. Making sound investment decisions about technology is a major challenge facing educational policymakers and planners. New technologies offer options to both expand educational opportunity and improve quality, but inappropriate decisions regarding whether to use technology or what type of technology to use can be costly and can impede the success of a distance education program. Unfortunately, the information needed to make such decisions is limited. Care should be taken to avoid allowing the novelty of technology to drive decisions regarding the most appropriate delivery mode for distance education programs, overshadowing the more important decisions regarding curriculum and instructional quality. If a country's conventional education or teacher training

program is not effective, using a new technology to deliver that education or training will not make it any more effective.

Affordability. Distance education programs need sound financial planning and management to ensure sustainability. In many cases, developing countries find that funds are not available to continue a distance program after donor funds are terminated, so it is important that initial investment be accompanied by adequate funding for recurrent expenditures. A related problem arises when the per-student cost of adding distance education or other education technology is large relative to a country's average per-student financial allocation for that educational level. For instance, if a distance mathematics program using computers consumes financing equal to 50 percent of the country's per-student budgetary allocation, its financial future is likely to be bleak, despite high putative benefits. When such a situation is encountered, the country would be best advised to opt for pilot programs that test less expensive alternatives than to do away with the distance education program entirely.

The World Bank's role

Within the framework of the new Strategic Compact, recently approved by its Executive Board, the World Bank is expanding its own distance education and learning activities and helping member countries build their capacities to conduct distance education. To this end, the Bank is supporting the creation of a new Web site on distance learning called EducationNet (EdNet), in order to provide high-quality information services on distance learning for policymakers, education specialists, and investors. It is organizing a series of regional training workshops on distance learning for client countries and is funding projects to build distance learning capacity. The Bank is also launching its own global distance learning program to disseminate knowledge about development around the world through its field offices and a wide variety of other networks. [F&D]

References:

Anthony W. Bates, 1995, *Technology, Open Learning and Distance Education* (London: Routledge).

Joanne Capper, 1990, Review of Research on Interactive Videodisc for Training (Alexandria, Virginia: Institute for Defense Analyses).

John S. Daniel, 1996, *Mega Universities and Knowledge Media: Technology Strategies for Higher Education* (London: Kogan Page).

Michael Moore and Greg Kearsley, 1996, *Distance Education: A Systems View* (Belmont, California: Wadsworth).