Tertiary Distance Education and Technology in Sub-Saharan Africa

by

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<td>AAU</td>
<td>Association of African Universities</td>
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<td>ADEA</td>
<td>Association for the Development of Education in Africa</td>
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<td>AIDS</td>
<td>Acquired immunodeficiency syndrome</td>
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<td>AUPELF-UREF</td>
<td>Association des Universités Partiellement ou Entièrement de Langue Française– Université des Réseaux d’Expression Française</td>
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<td>AVU</td>
<td>African Virtual University</td>
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<td>CAERENAD</td>
<td>Centre d’application, d’études, et de recherche en apprentissage à distance</td>
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<td>CES</td>
<td>Centre for External Studies (University of Namibia)</td>
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<td>COLISA</td>
<td>Confederation of Open Learning Institutions in South Africa</td>
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<td>FORCIIR</td>
<td>Formation continue pour l’information informatisée en réseau</td>
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<td>GER</td>
<td>Gross enrollment ratio</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<td>ICT</td>
<td>Information and communication technology</td>
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<td>Non-governmental organization</td>
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<td>OUT</td>
<td>Open University of Tanzania</td>
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<td>RESAFAD</td>
<td>Réseau Africain de formation à distance</td>
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<td>REFER</td>
<td>Réseau électronique francophone pour l’éducation et la recherche</td>
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<td>UNESCO</td>
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<td>WGHE</td>
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The higher education crisis has five components: inability to accommodate the volume and variety of student demand; education is too costly and not sufficiently relevant to the labor market; teaching methods are too inflexible to accommodate a diverse student body; educational quality is not assured; and the university sense of academic community is being eroded.

Daniel (1996:11)

The available ways of construing higher education are utterly inadequate to the modern age. The university has derived its legitimacy from a project built around knowledge, around knowing the world. But the modern world is unknowable — not only epistemologically, socially and culturally, but in terms of our personal identities.... We need, therefore, to do nothing short of jettisoning the whole way we have construed higher education for one thousand years and, instead, work out a new conception of education which starts from understanding that the world is unknowable in any serious sense.

Barnett (1997:43)

INTRODUCTION

On the eve of the 21st century, tertiary education in Sub-Saharan Africa confronts unrelenting pressure to expand access in spite of declining educational quality and stagnant funding possibilities.¹ The symptoms of this fundamental imbalance between enrollments and funds are multiple: overcrowded classrooms, poorly equipped learning facilities, brain drain of academic staff, declining research output, frequent strikes and campus closures, outdated and irrelevant curricula, and high rates of unemployment among graduates. Fueled by population growth and increased access to primary and secondary education, the number of African students seeking entrance to tertiary programs will surge during the coming decade. But under present circumstances, only a tiny percentage of them will be successful. Consequently, where democratic societies offer channels for anxious parents and expectant students to voice their frustrations, tertiary education appears poised to become a volatile political issue. Now, then, is the time for governments to anticipate the rising chorus of such demands and to take steps that will ease the pressures for access while upholding the national interest in good-quality tertiary education and responsible stewardship of national resources. This paper addresses the question of how African nations might improve the balance between access to tertiary education and funding for it without further sacrifices in quality. In brief, the answer lies in the use of distance learning complemented, in some cases, with a selective application of new information and communication technologies. The following discussion provides an overview of tertiary-level distance learning and technology experience throughout Sub-Saharan Africa and the world. It highlights the relevance of these experiences for African nations that are committed to achieving increased participation in the global knowledge-based economy of the 21st century.

¹ This report follows the precedent established by the Organisation for Economic Co-operation and Development (OECD) in its recent report, Redefining Tertiary Education (OECD 1998:14), in which “tertiary” is used in preference to “higher” education because “higher” often connotes university. Use of the latter term runs the risk of excluding tertiary-level alternatives to universities, including distance education programs, where many of the more innovative developments are now taking place.
AFRICAN TERTIARY EDUCATION IN PERSPECTIVE

The challenges confronting African tertiary education do not exist in isolation from broader economic, technological, and educational changes in the world at large. With the emergence of a global knowledge-based economy, governments are increasingly willing to invest in education (World Bank 1998a). The need for life-long learning to enable workers to upgrade their skills and maintain competitiveness within rapidly evolving economies is generating a worldwide demand by adults for part-time tertiary education. In response, the more entrepreneurial tertiary institutions now recruit students from a global pool and reach out to other countries through educational programs provided at a distance. As a result, tertiary education is becoming an internationally tradable commodity in an increasingly competitive global market (Bennell and Pearce 1998). Recognizing this fact, the World Trade Organization’s negotiations for a General Agreement on Trade in Services (GATS) in November 1999 set rules for the education and training services sector in the global market for the years ahead.

Under such circumstances, how can Sub-Saharan Africa expand its very low tertiary education enrollments and prepare its tertiary institutions for the educational demands of the 21st century—and accomplish this under severe resource constraints without sacrificing educational quality? This question confounds policymakers and institutional managers alike. For most African countries, maintaining tertiary-level gross enrollment ratios at the current 2 to 5 percent is not a long-term option. From a human resource perspective, additional numbers of skilled professionals will be needed to manage a nation’s increasingly complex public and private affairs and to foster its international economic competitiveness. From a political perspective, local demands to expand tertiary enrollments in Africa will constitute a political time bomb. As such, they are likely to be irresistible.

The political time bomb of tertiary enrollments is easily illustrated (see Attachment 1, Table 1). On the basis of demographic projections for the 18–23-year-old age cohort traditionally associated with tertiary education and conservative application of nothing more than the country’s current gross enrollment ratio, it is evident that at least 16 countries of Sub-Saharan Africa will need to double their current tertiary enrollments over the coming decade (i.e., increase enrollments at a rate of 7 percent annually) just to enable a constant share of their populations to pursue tertiary-level certifications. Unfortunately, the current pandemic of human immunodeficiency virus (HIV) and acquired immunodeficiency virus (AIDS) in Africa, which accounts for 70 percent of all new AIDS cases in the world, will require many of these countries to produce even higher numbers of university graduates in order to maintain existing human resource capacities. Planning for supply of academic staff at universities will need to be based on unprecedented assumptions about the rate of attrition. If these same countries would seek to improve their tertiary enrollment ratios by a few additional percentage points, they would have to triple current tertiary enrollments by the year 2010. They are therefore prime candidates for distance education interventions.

It appears highly unlikely that these countries (and many others) will be able to expand tertiary enrollments by using conventional face-to-face

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2 Interestingly, the World Bank’s 1988 policy paper, Education in Sub-Saharan Africa: Policies for Adjustment, Revitalization and Expansion, barely mentions distance education beyond the need to develop alternative delivery modes for post-primary education in order to accommodate expanding enrollments (World Bank 1988:99). The Bank’s update of this strategy, which is nearing completion, gives the topic much more attention.

3 The tertiary-level gross enrollment ratio for Sub-Saharan Africa is 3.6 percent. This compares unfavorably with the Arab states (14.0 percent), Asia (10.4 percent), and Latin America (18.4 percent) (United Nations Educational, Scientific and Cultural Organization [UNESCO] 1998a:2-25).

4 These countries are Angola, Benin, Burkina Faso, Burundi, Central African Republic, Republic of Congo, Côte d’Ivoire, the Democratic Republic of Congo, Ethiopia, The Gambia, Madagascar, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.
teaching methods and the current residential campus model. During the 1980s public expenditure per tertiary student in Sub-Saharan Africa dropped from $6,300 to $1,500 in real terms (World Bank 1994:17). The 1990s have witnessed a further decline of an estimated 30 percent. For many African countries, this means that public expenditures per tertiary student are nearing or falling below the level, estimated at $1,000 per student, which is believed necessary to provide a minimally acceptable level of tertiary education in today's world (Partnership for Capacity Building in Africa 1997:9). With many African nations already spending a significant portion of gross national product on education, the additional resources required simply to maintain current levels of tertiary enrollments using the traditional residential campus model will not be available.

What, then, is the alternative? This paper argues that distance learning techniques, augmented by a judicious use of new information and communications technologies, are a viable option for African governments and societies that wish to expand higher education enrollments in the decade ahead. Distance learning programs are not by themselves the solution to this problem. However, they can make a much larger contribution to meeting this challenge than they have to date.

But to do so, all parties involved in national educational development efforts must recognize that distance education is fundamentally different in its structure, organization, and delivery than conventional face-to-face instruction. It is based upon a specialized division of labor in the development and provision of courses. It requires technology of some kind to mediate between teacher and student because the two are separated by time and distance. These differences have produced specialized processes for the design of learning, specialized techniques of instructions, and specialized organizational structures that are very different from those of conventional tertiary institutions. If the unique attributes of distance education are not recognized at the outset of policy and planning initiatives to expand its use, its potential benefits will not be realized. This oversight is perhaps the main reason that distance education has not been as successful in Africa as it could have been.

WHY DISTANCE EDUCATION?

The potential benefits associated with an expanded use of distance education in Africa are numerous. If adequately managed—this is a necessary requirement—distance education could enable an expansion of tertiary enrollments at less cost per student than under the traditional residential campus system. Greater flexibility in the design and delivery of curriculum content than is normally associated with classroom teaching enables distance education courses to adapt to specific student needs or work requirements, thereby enabling greater relevance. Distance education also accommodates the growing demand for lifelong learning more easily than do residential programs.

Distance education offers other benefits as well. It can effectively reach those learners who have been denied access to tertiary education, for example, women who are unable to attend traditional educational programs because of household responsibilities or cultural constraints, economically marginalized groups, refugees, and the incarcerated. Also, distance learning programs at the postgraduate level, delivered by universities in the developed world through the Internet and supported by on-line libraries, are increasingly available to self-motivated students in Africa who seek postgraduate qualifications. As expanding tertiary enrollments generate a parallel need for additional numbers of academic staff, graduate training becomes more difficult to accomplish because the costs of overseas graduate training increases and donor funding of study fellowships declines. Under these constraints, internationally available "virtual" postgraduate programs can help to produce the needed increases in academic staff.

Distance education is the most modern form of educational delivery. It is a 20th century invention based on organizational structures and technologies produced by the industrial revolution. As we enter the 21st century, distance education is innovating rapidly and expanding around the globe. In the past, distance education was often viewed

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5 For more extensive discussion of the fundamental differences between distance education and conventional education, see Peters (1989) and Holmberg (1995).
as inferior by much of the traditional academic community because it tends to have lower graduation rates and less direct interaction between teacher and student. Today, this no longer needs to be the case. Experience accumulated worldwide is contributing to more effective program design. It has repeatedly been demonstrated that there is no significant difference in student performance according to the teaching methods employed (Moore and Kearsley 1996:99, Rumble 1997; Turoff 1997a; Willis 1994:42). The choice of medium for educational delivery therefore depends mainly on the specific circumstances of the learning situation. However, mixed-media teaching has been shown to have greater learning impact than single-medium approaches. It is not uncommon for well-designed distance learning materials to be used by lecturers and students in the classroom, thereby providing a boost to the quality of classroom instruction.

These benefits have made tertiary distance education the world’s fastest growing educational sector. Asia now boasts 3.5 million tertiary distance education students, with China alone accounting for 1.4 million (UNESCO 1998a). Latin America has more than 1 million tertiary-level distance education students, with particularly active programs in Brazil, Colombia, Mexico, and Venezuela (World Bank 1998a). In comparison, the United States has more than 2 million students, and Canada has half a million.

AFRICAN EXPERIENCE WITH DISTANCE EDUCATION

Distance learning and associated technology applications are not new tools for tertiary institutions in Africa. In anglophone Africa, the University of South Africa (UNISA, enrollment 117,000) began in 1946 as a correspondence university and has evolved into one of the world’s largest open distance learning universities. Since the 1960s, Botswana, Kenya, Malawi, and Zambia have used distance education for teacher training (John 1996). By 1985, the anglophone countries of Africa contained 25 state-funded distance education institutions (Murphy and Zhiri 1992:7). The first francophone experience in distance learning involved correspondence courses offered in 1970 by Marien Ngouabi University in Brazzaville. During the 1980s and 1990s teacher upgrading through distance education programs was undertaken in Benin, Burkina Faso, Burundi, Cameroon, the Central African Republic, Côte d’Ivoire, Mali, and Togo. An experienced non-governmental organization, INADES-Formation, established by Jesuits in 1962 and headquartered in Abidjan, now offers practical skills development for poor rural populations through distance education programs in 20 African countries.

More than 140 public and private institutions provide tertiary distance education services within Sub-Saharan Africa (Roberts & Associates 1998:9). These programs rely mainly on print media, supplemented by written assignments and face-to-face tutoring (Murphy and Zhiri 1992:36). Some of them have also made creative use of national broadcast radio, audio cassettes, and more recently, e-mail. The bulk of these programs upgrade skills for in-service teachers. Other main uses include imparting business management or information technology expertise to employed workers. A recent survey of 143 tertiary distance education programs in Africa found that 52 percent of anglophone programs and 67 percent of francophone programs targeted teachers and school administrators (Roberts & Associates 1998:13). Notably, 12 percent of programs in both language areas were aimed at university students, and this number is growing.

The same survey registered a slight difference between anglophone and francophone countries in the use of telecommunications technology for distance education. Although virtually all anglophone and francophone programs used print media, the former made comparatively less use of the Internet, although this situation is changing rapidly. A significant minority of francophone programs employed the Internet to some degree, but used it more for program coordination than for direct teaching. Satellite broadcast is now used on a pilot basis by both anglophone and francophone participants in the African Virtual University project initiated in 1996 by the World Bank.
Outside the sphere of distance education, Internet connectivity is expanding rapidly but unevenly. Some 49 of 54 African countries have access to the Internet in their capital cities (Jensen 1999), but this is almost exclusively for use by upper-class urban populations (Bamba 1999). Particularly active Internet markets are found in South Africa, Ghana, Senegal, Mozambique, Kenya, Uganda, Zimbabwe, and Côte d’Ivoire. In early 1999, a survey of Internet capability at 15 Sub-Saharan Africa universities outside of South Africa (considered to be among the more progressive in their use of information and communications technology) concluded that only four possess full Internet capability, including Web sites; six have limited Internet capability; three have e-mail only provided through a campus network; and two have limited e-mail capacity through individual connections in some departments (Materu-Behitsa and Levey 1998). Notably, the 24 federal universities in Nigeria are gradually becoming linked electronically through the Nigerian Universities Network (NUNet). A recent survey of francophone universities indicates that at least 11 of them have full Internet access and maintain their own Web sites. International infrastructure in support of African Internet connectivity will improve considerably in 2000 with completion of a sophisticated submarine optical fiber cable that will link Western and Southern Africa with Europe, Asia, and the rest of the world. This cable has the intrinsic ability to propel most of Sub-Saharan Africa into the next millennium (Farrell 1999:91). When this cable becomes operational, the main remaining constraints to African Internet connectivity will be national telecommunications monopolies and their outdated policies (Kwankam and Ningo 1997:2).

Today the landscape of distance education in Africa is changing rapidly. Experimentation with various distance learning methods is under way in a number of countries. Namibia and Ghana have formally declared dual-mode instruction to be their national policy; students may obtain the same undergraduate degree through either residential or on-campus study or through distance learning. Botswana, Cameroon and Zambia are using a university-based Internet system to support interactive regional study centers for distance learners (Pecku 1998). Tanzania, Botswana, and Zimbabwe have established new tertiary institutions wholly dedicated to distance education. The Zimbabwe Open University already enrolls nearly 10,000 students in nine programs, and recently launched a master’s degree in education for in-service teachers. Uganda enrolls 1,400 students in a Bachelor of Science in education given at a distance and is planning to expand into the areas of law, technology, and sciences. Nigeria’s Centre for Distance Learning (Abuja) offers bachelor of arts and bachelor of science degrees in 14 subject areas. Madagascar has pioneered the use of audio cassettes for university programs in law and the social sciences. Côte d’Ivoire, Congo, Togo, and Benin are in various stages of setting up university-based distance education programs. In Senegal, distance education supports teacher training and master’s degree programs in health and law (Republic of Senegal 1997). Several African nations use distance education on a scale that is proportionately greater than in Europe or North America, but less than that achieved by many Asian countries (see Attachment 1, Table 2).

New information and communications technologies are contributing to these changes. The provision of distance education based on satellite transmission and interactive e-mail is being tested by the African Virtual University project sponsored by the World Bank, and by the Université Virtuelle Francophone supported by the Agence universitaire francophone (AUPELF-UREF). The development of tele-centers—public sites that offer access for a fee to telephones, fax, e-mail, and full Internet services—is growing in South Africa, Ghana, Nigeria, Senegal, and elsewhere. In some cases, tele-centers are being expanded to offer access to learning (Farrell 1999:95). The Confederation of Open Learning Institutions in South Africa (COLISA), a partnership of the country’s three main tertiary distance education institutions, is developing Internet-based

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5 Régine Thomas, personal communication, 1999. The universities are located in Abidjan, Conakry, Cotonou, Benin; Dakar, Senegal; Libreville, Gabon; Lomé, Togo; Nouakchott, Mauritania; Ouagadougou, Burkina Faso; Port-Louis, Mauritius; Antananarivo, Madagascar; and Yaoundé, Cameroon.
These developments have proceeded unevenly across the continent. As a result, individual countries vary considerably in their capacities to design, manage, support, and evaluate tertiary distance education programs. A survey of institutional capacities for distance education in 22 African nations and subsequent analysis employing Guttman scaling techniques indicate a fairly logical sequence to the development of these institutional capacities. The observations summarized in Attachment 1, Table 3 indicate that most countries possess university distance education units engaged in distance education based on printed materials, often with donor support. These core capacities later give birth to greater diversity of provision (e.g., private providers) and a wider range of technology use (e.g., radio, television, Internet). It is only at rather advanced stages of institutional differentiation that explicit governmental policies for distance education emerge, non-governmental organizations join the ranks of distance education providers, national professional associations for distance education take shape, and open universities are established. The cumulative development of distance education capacities for these 22 countries is presented in Figure 1. On balance, the figure suggests that institutional capacities for dis-

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7 Figure 1 is based on the concept of structural differentiation, which was developed by the French sociologist Emile Durkheim. It is essentially a measure of the institutional complexity present in a community, district, or nation, which reflects the extent of its social division of labor and hence the extent of its specialized capacities. The presence or absence of various institutions and services is determined by simple observation, and from this a Guttman scale can be constructed. Because the scale is accumulative, a differentiation score can be assigned to each community, district, or nation that reflects its relative developmental position in relation to the other cases (Young and Fujimoto 1965). The data for Figure 1 are contained in Table 2.
Differing circumstances in each country, together with varying levels of institutional capacity outlined in Figure 1, suggest that nations are well advised to craft their own strategies in light of local needs, available institutional capacities, and international knowledge. Nevertheless, some generally applicable lessons can be drawn from these diverse experiences. These lessons are presented below.

**WHAT ARE THE POTENTIAL BENEFITS OF TERTIARY DISTANCE EDUCATION?**

As the most modern form of educational provision, distance education at the tertiary level offers Africa the possibility of leap-frogging certain phases in educational development. Additionally, it creates the possibility of increased access to tertiary education at more cost-effective levels. Rising mass education under the constraint of diminishing resources is a global phenomenon not limited to the African continent. However, these trends are more highly amplified in Africa. This provides an opportunity for Africa not only to tackle its tertiary education problems more effectively but to contribute better solutions to other nations for the provision of tertiary education.

Tertiary distance education holds the promise of three primary benefits for Africa: increased access to education, improved educational quality, and more efficient use of limited resources.

**GREATER ACCESS**

Distance education programs can increase educational access by reaching out to four commonly excluded groups: secondary school graduates who fail to gain admission to a university, married women with household responsibilities, geographically isolated or uprooted students (e.g., refugees), and economically disadvantaged communities. Of these, the largest and most rapidly growing group is secondary school graduates who were unsuccessful in the competitive admission process for tertiary education. Low tertiary enrollment rates mean high levels of exclusion. For example, in Ghana only 6,088 students out of 22,477 qualified applicants (27 percent) were admitted to the universities in 1996. In Uganda, just 6,000 out of 11,000 secondary school graduates who qualified for admission in 1996 gained university entrance (54 percent). In Nigeria, less than 20 percent of the 475,923 candidates for university admission in 1996-97 were successful. With residential space at a premium, university aspirants increasingly view tertiary distance education as a feasible alternative to residential instruction. The University of Swaziland, for example, has offered tertiary programs since 1995 through its Institute of Distance Education explicitly for university applicants who qualify for admission but who are unable to gain entrance because of lack of space and facilities. The number of students has grown from 100 in 1995 to 500 in 1999 and now represents roughly 13 percent of total university enrollment.

Women now constitute 35 percent of tertiary enrollments in Africa (UNESCO 1998a:2-14) but only 23 percent of university students (UNESCO 1998a:18). This sizable under-representation indicates considerable potential for development gains stemming from increased participation rates by African women in tertiary education. Home-based study on a flexible schedule is well suited for women who must also fulfill family responsibilities, and may be particularly appropriate for Muslim societies. This seems to be borne out by tertiary distance education enrollment statistics from a variety of countries. In South Africa, for example, 70 percent of Vista University students and 50 percent of UNISA students are women. In Namibia, 77 percent of distance learners are women. In Madagascar, 46 percent of distance education students are women. In Swaziland, the proportion is 44 percent. For additional evidence, see Attachment 1, Table 2a.  

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8 A faculty member from the Open University of Tanzania is completing a Ph.D. dissertation at the University of Alberta, Canada, on the cultural and financial constraints to women's participation in tertiary distance education programs.

9 It should be noted, however, that the advantages of home study for women are contested by some, who point to women's heavy home and agricultural responsibilities and argue that they must leave home in order to stand a chance of educational achievement.
Distance learning can extend tertiary education opportunities to students in rural areas, small towns, or refugee camps who do not have convenient access to tertiary institutions. For the isolated but motivated student, the savings can be considerable: travel time, travel expense, and the continuation of work income while studying. In Thailand, for example, 70 percent of tertiary distance education students are located in rural areas (Dhanarajan et al. 1994:43). For a portion of Africa’s 6 million refugees, and for those who may in the future be displaced from their countries by social tensions and political instabilities, distance learning programs could help in getting the skills needed for self-sufficiency and responsible citizenship. This is a challenge that has not yet been seriously confronted in Africa. However, one ground-breaking experience in refugee education has been under way since 1994 at the Southern Africa Extension Unit in Tanzania. With assistance from the United Nations Higher Commission on Refugees, a distance education program has been developed for refugees from Burundi who are living in camps in western Tanzania. The program offers basic English study to these French-speaking Burundians, as well as mathematics, history, geography, and Swahili at the secondary level. Its purpose is to prepare these refugees to take advantage of other educational opportunities available in Tanzania. At present, the program enrolls 800 students and has produced more than 2,000 graduates.

Where there is sufficient political will, distance learning can be a feasible option for impoverished or socially marginalized communities. Again in Thailand, studies show that family income levels for residential university students are 4 or 5 times higher than those of distance education students. Anecdotal evidence from Africa suggests that similar income disparities exist in a number of countries. In the highly competitive context of tertiary admissions, access by elite students to private secondary schools or special tutors can make the difference between entrance and exclusion. Because it allows students to work and study simultaneously, and because it does not require the additional costs of campus residence, distance education offers an alternative pathway to tertiary training for students with limited financial means. Over time, it could contribute to a narrowing of the education gap among different ethnic groups and thus to a country’s long-term political stability.

**IMPROVED QUALITY**

Distance education fosters educational quality and relevance in several ways. Because teacher and student are separated by distance, successful curriculum design requires clarity of communication, coherent logic, and good organization in its presentation. This increases the effectiveness of its pedagogy and, where the distance education courses are prepared under contract by classroom lecturers, often contributes to improved face-to-face instruction as well. In addition, by using standardized materials developed by subject experts, it promotes quality assurance and equitable provision of education. Moreover, where good instructional materials for distance education exist, experience shows that they are quickly appropriated by classroom students as study aids, thereby helping them to improve their academic performance. In several countries (Namibia, South Africa, and Tanzania), distance education is being used to provide remedial or bridging programs to secondary school graduates who lack the qualifications for admission to a tertiary education program.

When countries fall within the sphere of influence of multiple external distance education providers, quality control and certification of equivalence for degrees can become a challenge. This is the case in Mauritius, where the Tertiary Education Commission has exhaustively reviewed distance education course offerings from Australia, India, South Africa, and elsewhere. Over time, the accreditation problem is expected to grow as

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10 Among the fundamental questions to be addressed are: Whose responsibility is it to educate refugees? What are the obligations of the home country and the host country? Who pays?

11 In the United States, for example, the non-profit Distance Education and Training Council of Washington, D.C., nationally accredits all distance education courses. Its experience in this area constitutes a useful reference for African accreditation bodies in tertiary education.
international markets for tertiary distance education develop and become more competitive. The long-run solution is likely to be a certification of the demonstrated competencies of individual students on the basis of internationally accepted performance criteria rather than involvement in ever more demanding efforts to determine equivalence of constantly shifting course offerings and content. Many technical and professional fields have national qualification or licensing examinations that can play this validating role for distance education graduates (Rumble and Oliveira 1992). Notably, the new Western Governors’ University in the United States offers students the option of obtaining a degree entirely on the basis of self-study; the degree is awarded once the student has passed a series of competency-based examinations. In the future, this approach seems certain to expand.

Educational quality can also be enhanced by the prudent use of new information technologies to support classroom teaching in direct or indirect ways. Direct support to teaching occurs when lecturers can access the latest scientific information, well-developed syllabi, reference resources, effective learning exercises, and creative teaching aids via the Internet. Indirect support occurs when e-mail and the Internet are used to nourish local research activities that have a positive impact on teaching. In the quest for such benefits, the Senegalese national telecommunications company, SONATEL, is expanding Internet access for universities, training centers, and firms.

In the near term, the Internet’s impact on African tertiary education is likely to be greater in research than in education (Langlois 1998). By allowing worldwide access to large amounts of relevant information, the Internet diminishes research costs and compensates for the shortage of books and scientific journals that often plagues university libraries. Through e-mail, it enables increased interaction among scholars and fosters the emergence of trans-geographic research teams. The Internet also allows the rapid dissemination of research results while facilitating peer review (and therefore quality). Finally, it helps to increase local research capacity by sharing equipment and facilitating the remote use of costly scientific instruments. One initial effort to tap this potential is Uninet, an academic and research network linking 58 universities, polytechnics and research centers (and 500,000 students and staff) in South and Southern Africa (Knoch 1997). A similar research networking initiative, called Réseau electronique francophone pour l’éducation et la recherche (REFER), is being developed in francophone Africa.

The special significance of university libraries: University libraries (and librarians) will be key actors in efforts to raise the quality of higher education and research through the application of new electronic technologies. The emergence of a global knowledge-based economy, together with the information and communications technologies that bring it into being, are expected to exercise a transforming effect on university libraries in Africa. Within a knowledge economy, value increasingly lies not in possessing information but in developing the capabilities to access it and adapt it for new applications (Gibbons 1998). Most knowledge produced globally is not produced where its use is required. The challenge is how to get knowledge that may have been produced anywhere in the world to the place where it can be used effectively in a particular problem-solving context. Because Africa is not presently well equipped to participate in the global knowledge economy, developing the organizational and electronic capacities to identify, access, and adapt external knowledge for local problem-solving will produce developmental dividends.

This has significant implications for universities and their libraries. In the coming years, educational institutions will progressively be able to generate income not from the knowledge they possess, but from services structured around this knowledge. In this, libraries will play a fundamental role. And for this reason, the role and function of the university library should be given particular attention during any strategic planning process involving a university.

Libraries will become interactive information resource centers for the university and surrounding community, providing both traditional and com-
puter-based learning materials. They will merge gradually into electronically linked regional and global knowledge webs.\footnote{12} Over time, they will take on the important role of electronically disseminating university research findings to a worldwide readership, thereby combating superficial impressions that Africa as a region produces little new knowledge. An initial foundation for such an electronic network for research information and dissemination exists in 11 francophone countries where universities have established Internet-linked multimedia resource centers under the SYFED-REFER program sponsored by the Agence Universitaire de la Francophonie. In addition, libraries may provide sites for delivery of specialized courses, via the Internet or CD-ROM, that are equally available to students and the public at large. In fact, the University of Zimbabwe’s Media Centre recently initiated this practice in the area of biology.

For this transformation to occur, managers of tertiary education institutions and library administrators will need to understand and support the evolution of library roles from handmaiden to full partner in the academic enterprise. Tight institutional budgets will need to favor technology acquisition and training for library staff, and academicians will have to cede some of their limited funds for the common good. As this electronic knowledge network is built up, library staff will become more active members of curriculum and research teams, identifying relevant knowledge and sharing it with the team. This implies a significant change in the job descriptions, employment qualifications, and professional status of Africa’s university librarians.

The road to such transformation will be difficult. On most campuses, academic and library staff lack an awareness of what information and communication technology (ICT) can do for them. Information access and connectivity are generally limited. A small but significant group of African university libraries have no functioning computers. They are often located in countries where governments remain suspicious of ICT. A larger group of university libraries possess a few stand-alone computers equipped with dial-up e-mail (and perhaps a CD-ROM player). In most cases, this group is heavily dependent on donor assistance for the maintenance and development of its technology. Consequently, this group’s ICT gains are vulnerable to regression when donor financing ends. Only a very small number of university libraries—in Namibia, South Africa, Tanzania, Zambia—are linked to a local computer network with full connectivity to the Internet and can count on the necessary institutional support for sustainable ICT development. This number increased in 1999 with the completion of renovations at the Grande Bibliothèque in Cheik Anta Diop University of Dakar, Senegal. With funding assistance from the World Bank, this library will function as an electronic multimedia and information center for the university and serve as the Internet hub for a network of local libraries.

Even where university libraries possess some information technology, it is used very unevenly (an active minority of students are often the main users), for two reasons. First, the technology is unreliable because of fluctuating electricity supply and poor maintenance. The latter results from lack of know-how and the inability of meager library budgets to cover technology maintenance expenses. Second, library and academic staff have very little training in the use of these technologies. Consequently, few people know how to use the technologies or are able to teach others.

Library transformation is an area where development assistance agencies have much to contribute, because they have access to the technical skills, experience, and funds needed to launch this transformation. But to make effective and sustainable contributions, development partners must make a long-term commitment to library restructuring and to maintenance and development of the technology they install. Often, agencies have erred in providing technological tools without considering their implications for maintenance costs and asso-

\footnote{12} For developing countries to benefit from the explosion in the production of knowledge and access to it, educators and researchers need to protect time-honored principles of full disclosure and free flow of scientific information and resist tendencies to convert every bit of information into a piece of marketable intellectual property (Darch 1998:6).
Box 1. The African Virtual University Digital Library

Sponsored by the World Bank, the African Virtual University (AVU) is a satellite-based education system targeting post-secondary students throughout Sub-Saharan Africa. Established as a pilot project in interactive educational telecommunications, it seeks to use, on a large scale, the power of modern information technologies to increase access to desperately needed educational resources, particularly in the sciences, engineering, business management, and health care. The AVU’s educational services include degree programs, training seminars, remedial instruction, and access to an electronic library. At present, 22 anglophone and francophone universities in 16 African countries are AVU participants.

The AVU library, already operational, intends in the short term to provide one-stop shopping for research materials unavailable in local libraries. The digital library contains four components: a Z39.50 library interface gateway allowing seamless access to various databases; some 3,800 primary URL links (catalogued in USMARC record with abstract and index) to research reports and working papers at specific universities and research centers in the United States and Europe; and electronic access to 1,200 full-text scientific journals with an associated abstract and index service. Right of entry to the digital library is authorized through a list of registered Internet protocol numbers. Participating African institutions can access this library and download information at no charge during an initial trial period. In the future, an annual flat-fee subscription will be introduced. Over the medium term, this library expects to act as a catalyst for the automation of African university libraries, to preserve rare African collections through scanning and digitalization, and to disseminate scholarly work by the African scientific community through on-line publishing.13

13 The Université Virtuelle Francophone has just launched a “médiathèque” that contains specialized bibliography (journals, theses, full-text references) in medicine, agriculture, health, and computer science. Access is free to staff and students of designated partner universities, and annual subscriptions are available to other interested individuals.
charges for distance learning are expected to be less than those for residential instruction.

Second, distance learning often operates at more efficient staff/student ratios, thereby reducing the proportion of institutional budgets dedicated to staff salaries. Similarly, it minimizes the need for investment in costly physical facilities (and in their maintenance), thus enabling more funds to be used in support of teaching inputs and learning activities. These efficiency gains, however, must be won through careful planning and creative management. They cannot be reaped by simply introducing distance education programs. Many factors combine in complex ways to influence the costs of distance education. For example, it is estimated that up to 100 hours of course design and development time are necessary for each hour of student learning time, although this ratio varies widely in practice. In comparison, good-quality classroom teaching can be provided for 10 hours of preparation time for one hour of learning (Rumble 1997). Other factors that influence course costs include the useful life of the course, the number of students enrolled, the type of delivery system used (costs rise sharply when a medium other than print is used), the nature of academic assessment, the kind and extent of student interaction, and the levels of expertise employed in the design, development, and delivery of courses.

Third, unlike the traditional campus model, tertiary distance education offers declining marginal costs. As enrollments rise, the cost per student goes down (although the costs per graduate may be high if the completion rate is low). Cost analysis of tertiary distance learning programs in Canada, Ireland, and Israel indicate that their unit costs per student are roughly equivalent to the unit costs of on-campus teaching with enrollments as low as 3,000 (Curran 1993; Daniel 1996:62). In Kenya and Nigeria, bachelor degrees in education were offered at a distance for smaller enrollments while maintaining this cost-per-student advantage (Cummings and Olaloku 1993; Makau 1993). Taking into account the fact that the cost of telecommunications is falling dramatically and will soon cease to vary with distance (Cairncross 1995), the gradual incorporation of new technologies into the delivery of distance education could further increase its cost-efficiency.

Fourth, distance learning is cost-efficient because it employs a modular approach. Course materials can be updated or modified to suit particular types of students without being reproduced in their entirety. This flexibility will become a more significant advantage as tertiary education in the 21st century confronts the challenge of serving an increasingly diverse pool of students with an expanding range of learning requirements.

**WHAT IS THE MAIN CONSTRAINT TO ACHIEVING THESE BENEFITS?**

Reaping the benefits of accessibility, quality, and cost-efficiency is contingent upon solid program management. In fact, distance learning programs generally require better management skills than traditional tertiary programs. With scattered students, dispersed part-time tutors, far-flung logistics, unreliable communication services, time-sensitive production and distribution of learning materials, and detailed student records, successful distance education programs require a management team with above-average skills in organization, logistics, and problem-solving. This management team need not be large, but it must be capable.

For the most part, distance education makes use of existing staff and facilities and therefore does not require major staff recruitment or expensive building campaigns. If desired, it can be managed through a relatively small coordinating unit housed on an existing university campus, as is the case of the National Distance Education Centre in Ireland. Likewise, tutoring and academic support for students can be arranged by contracting with experienced local teachers or other professionals on a part-time basis and by renting community educational facilities on evenings, weekends, or both.

New information and communications technologies can help to make distance learning programs more manageable. Computerized management information systems are now available to
support complex logistics, including inventory management and materials dispatch. Computerized management systems are also essential for the administration of student records in an era of lifelong learning (registrations, scheduling, grades, assessments, credits acquired, learning history). Projected developments in telecommunications technology and personal communication devices are expected eventually to do away with expensive in-house technology systems. Already, the skillful use of desktop publishing and laser printing capabilities has reduced the need for extensive warehousing of instructional materials for many distance learning programs.

**WHAT NATIONAL POLICIES TO CHOOSE?**

Countries interested in developing their capacities to provide tertiary distance education will need to formulate policies to shape this particular sub-sector, policies to guide teaching and learning, and policies for institutional development and capacity-building.

**THE NEED FOR A STRATEGY**

The purpose of national policy is to define public goals for a given sector and to chart a course for attaining them. Although very few African nations possess a formally articulated policy to guide tertiary distance education, the existence of a publicly accepted strategy in this area has proven essential for setting priorities, marshaling resources, and launching a meaningful initiative (Butcher 1997:8). Countries that have developed policy frameworks for tertiary distance education include South Africa, Madagascar, and Mauritius. These statements are worth studying. Although national conditions will shape much of their specific content, all policies will need to address four common questions.

Should distance learning be a separate or integrated part of the tertiary system? Experience teaches the value of integrating distance education fully within the existing formal education system (Willis 1994:11). Where this is not accomplished, the danger is that distance education will remain at the periphery of the educational system, undervalued and underused. Full integration helps to reduce inevitable resistance to innovation within existing tertiary institutions and does much to overcome the perception that distance education is somehow an inferior product when compared with residential instruction. Dual-mode approaches that make use of existing academic staff and facilities reduce the competition for scarce resources often associated with the establishment of a new institution and erode staff resistance by offering opportunities for direct participation. Likewise, common admissions policies for residential and distance students, together with the award of a single institutional degree based on common standards, will do much to offset the notion that distance education is of inferior status.

Integration works best when some distance learning is undertaken by most students in most departments. At the University of Mauritius, for example, first-year students are taught at a distance and move to residential status only after successful completion of the first year of study. Other tertiary education systems that offer students a choice between residential and distance education, or any combination of the two, include Australia, Canada, and the University of the South Pacific. This approach avoids attaching stigma or status to specific student categories by offering education through a combination of modes that spans face-to-face instruction at one end of the continuum to distance learning at the other. The student then chooses the particular mix of face-to-face and distance education classes that he or she desires to undertake in any given academic year. Although fully integrated residential and distance learning programs remains the goal, in practice, such integration has proven politically contentious within institutions because of rigidities and resistance discussed below (see "What Management Choices Must Be Made").

Should access be open or conditional? The multitude of aspirants to tertiary education in Af-

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13 Australia has been particularly successful in integrating distance learning with the tertiary system. As a result, it is common for students to take a combination of on-campus and distance courses. For an analysis of distance education in Australia, see Evans and Nation (1989).
rica, when coupled with reports of widely varying quality in educational preparation at the secondary level, suggest that admission to tertiary distance education programs should be selective, at least for the near term. Selectivity based on student qualifications or assessment of ability will make student numbers more manageable and enable higher pass rates, thereby contributing to the cost-effectiveness of these programs. In the interests of fairness and equity, however, governments may wish to consider offsetting selective admissions with fully open entry (i.e., no requirements) to a qualifying or bridging course, which must be passed as a requirement for admission to the tertiary distance education program (Murphy and Zhiri 1992:31).

What technology should be employed?
Numerous studies from around the world produce a consistent answer to this question: the medium of instruction does not make an important difference in student achievement, attitudes, or retention (Moore and Kearsley 1996:99; Rumble 1997; Turoff 1997a; Willis 1994:42). In fact, how the media are used has proven to be more important than which medium is selected. Furthermore, multiple media appear to be more effective than a single medium, with interactivity between students and tutors contributing a major boost to learning. Because the choice of technology does not influence learning, technology cost and maintenance become determining considerations.

On this basis, print media are likely to remain the best choice for most of Africa. They are inexpensive, reliable, and accepted. Students use them readily without needing access to specific equipment or services. At the same time, care is needed to avoid commitment to inflexible technolo-

Box 2. Case Study: Centre de Télé-enseignement de Madagascar

Madagascar is the only francophone country in Sub-Saharan Africa to develop a significant distance education program at the tertiary level. Its tertiary distance education programs are notable because they are largely the result of local initiative and resources.

Distance learning began before independence through cooperative programs with French institutions. The country’s first president actively supported this initiative, and the country’s first faculty of law was established as a result. National educational reform undertaken in the 1980s recognized that the demand for tertiary education far exceeded supply. This led to the decentralization of university campuses, continued development of distance learning, and the creation of a national center for distance learning at the University of Antananarivo in 1992. Using locally produced printed materials and audio cassettes, it teaches 8,000 of the university’s 20,000 students, offering programs in the fields of law, accounting, and management. The development of business skills is a major focus of the center’s work, which includes short internships with local firms. The center maintains 20 provincial study centers with reference libraries and 130 tutors for student support. Students are encouraged to form small study groups of 5 to 10 persons and to forward their questions in writing to provincial center tutors, who also respond in writing. Since 1997, national radio has also been used to transmit core courses. Plans to construct an electronic network linking all of the provincial centers with the national center are well advanced.

The center follows the academic year of the local universities, and its first-cycle degree is the same as that awarded by these universities. Its second-cycle degree is separate from the university’s because of a stronger vocational orientation, but both degrees are recognized and accepted by the public service. To date, 3,935 diplomas have been awarded. The examination success rate for 1997–98 has been slightly more than 50 percent, and various graduates have been admitted to third—cycle studies at French universities. The success of this program has attracted international attention in the form of technical assistance from UNESCO and the Government of France and partnerships with several universities in France.
<table>
<thead>
<tr>
<th>Institution/Country</th>
<th>Institution’s enrollment</th>
<th>Distance education as % of total tertiary students</th>
<th>Distance education unit cost as % of campus unit cost</th>
<th>% of unit cost obtained from student fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indira Gandhi National Open University, India</td>
<td>182,000</td>
<td>11</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td>Universitas Terbuka, Indonesia</td>
<td>170,000</td>
<td>18</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>University of the Air, Japan</td>
<td>68,000</td>
<td>4</td>
<td>13</td>
<td>n.a.</td>
</tr>
<tr>
<td>Open Learning Institute, Hong Kong</td>
<td>20,000</td>
<td>21</td>
<td>n.a.</td>
<td>86</td>
</tr>
<tr>
<td>Open University, Thailand</td>
<td>180,000</td>
<td>37</td>
<td>40</td>
<td>76</td>
</tr>
<tr>
<td>Open University, Sri Lanka</td>
<td>16,400</td>
<td>32</td>
<td>n.a.</td>
<td>30</td>
</tr>
<tr>
<td>Fédération Interuniversitaire de l’Enseignement à Distance, France</td>
<td>35,000</td>
<td>2</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Open University, United Kingdom</td>
<td>154,200</td>
<td>8</td>
<td>39-47</td>
<td>43</td>
</tr>
<tr>
<td>National Open University, South Korea</td>
<td>208,935</td>
<td>13</td>
<td>n.a.</td>
<td>62</td>
</tr>
<tr>
<td>China*</td>
<td>1,422,900</td>
<td>24</td>
<td>25-40</td>
<td>n.a.</td>
</tr>
<tr>
<td>National Centre for Distance Education, Ireland</td>
<td>3,500</td>
<td>5</td>
<td>43-66</td>
<td>70</td>
</tr>
<tr>
<td>Anadolu University, Turkey</td>
<td>470,072</td>
<td>26</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Universiti Sains, Malaysia</td>
<td>5,500</td>
<td>3</td>
<td>73</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Sources: Daniel (1996); Dhanarajan (1994).
* Data reflect various institutions participating in the China TV University program.

How can distance education be financed?
In many African countries, some degree of cost-sharing for tertiary distance education programs between students and government is an established precedent. This practice derives from an assumption that distance education students are employed and can therefore afford to pay a portion of tuition costs. In light of present limitations on use of the public purse to fund the expansion of tertiary education, this precedent is a fortuitous circumstance that should be preserved. The extent to which the costs of distance education are shared between government and students varies considerably around the world (Mugridge 1994). Comparative data on levels of cost recovery within tertiary dis-

15 For a discussion of how a chosen technology strategy can be implemented, see Daniel (1996: 154-58).

16 “Despite the wealth of experiences both locally and from around the world on which this country can draw in planning and implementing technology-enhanced learning, it appears that we are repeating many of the mistakes that have been made in such initiatives. Thus, South Africa does not yet appear to be ‘leapfrogging’ mistakes made around the world as was hoped would happen, but seems rather to be emulating those mistakes.” (South African Institute for Distance Education [SAIDE] 1999:15).
Tertiary Distance Education and Technology in Sub-Saharan Africa · William Saint

distance education programs of different countries are presented in Table 2. Within Africa, annual tuition costs in tertiary distance education range from $40 in Madagascar to $180 in Zimbabwe, $185 in Tanzania, and up to $1,200 for a master’s of business administration program in South Africa.

Private providers and their students can also carry a portion of the financial burden of tertiary distance education necessary to expand access. A recent review of 143 tertiary distance education programs in Sub-Saharan Africa found that 41 percent of 66 anglophone institutions are privately operated. In sharp contrast, none of the 67 francophone institutions surveyed is privately managed (Roberts & Associates 1998:12). In a context of limited government resources and technical capacities, such private programs can play an important role in expanding access to tertiary education, if educational quality can be ensured. One example is the new privately financed Mid-Rand University, located near Johannesburg, South Africa, and planned to operate largely on the basis of distance learning programs. Another private tertiary institution, Africa University in Zimbabwe, is

Box 3. The Team Approach to Development of Courses for Distance Education

Teams are used to develop distance education courses because of the various specializations that are needed. In a common approach, the content specialist, who is generally a university lecturer, outlines the basis for the study guide. This draft is then reviewed by an editor and a communications specialist. The revised course is further developed by a graphic designer, a pedagogical specialist, and perhaps a librarian or information specialist. Course materials are produced by a specialist in desktop publishing. An overall team leader manages the production schedule. The preparation team often remains responsible for modifications and updates throughout the useful life of the course.

Other approaches are also possible. In some cases, predesigned course templates are used to ensure standards and uniformity. In others, an author-editor core team is used in place of a full-scale team. The timing of pedagogical design inputs can vary from early to later stages in the process. However, experience suggests that when these design contributions occur at the outset of course development, the result is a superior learning resource.

Team-based preparation of course materials raises new questions for institutions that are making the transition from conventional to dual-mode teaching. Who should receive professional recognition for the work? Who owns the copyright? How broadly or narrowly should copyright be defined? How should team members be professionally assessed and remunerated for this work? A recent survey of how distance education institutions manage these issues (Perraton 1998) found that a wide range of practice prevails. Contracted course writers, whether internal or external, are often paid a lump sum. For the most part, the costs of editing, reviewing, copyediting, and preparing materials for desktop publishing were found to be roughly equal to the costs of course writing. The work of external writers often demands more editing and design inputs than the work of internal writers.

Perraton also found a variety of management arrangements but concludes that the most effective is when a university department is contracted to produce course materials for distance education. This enables regular departmental processes to be used for distributing work and ensuring that it is done. Financial management practices also may need to be adjusted to accommodate the characteristics of distance learning. For example, the high initial expense of developing course materials is appropriately treated as investment and amortized over several years of course use. As a result, recurrent staff costs may need to be treated as investment costs. This will require accounting system adjustments for universities that are moving from conventional to dual-mode instruction.
poised to initiate distance learning activities. Recognizing the value of such private initiatives, the International Finance Corporation has selected private higher education and distance education as two areas of emphasis for its investments in the private sector.  

World experience indicates that both governments and tertiary institutions tend to underfund distance education, thereby compromising its effectiveness. Underfunding is most common in the provision of critical student support services and in staff training and professional development. One deterrent is that distance education normally requires considerable up-front investment to train staff, design curriculum, prepare materials, and acquire the selected technology. Once this sizable hurdle is passed, the comparatively modest recurrent costs of the program can usually be covered in large part by student fees.

This front-loaded expenditure profile suggests that tertiary distance education projects are ideal candidates for international development assistance. Development partners’ funds can provide the seed capital and technical support to launch the program over an initial four- or five-year period with the assurance that the program should be self-sustaining after that. As one reference point, a successful four-year capacity-building project in tertiary distance education undertaken by the government of Mauritius with funding from the Canadian International Development Agency cost approximately US$500,000.

POLICIES FOR TEACHING AND LEARNING

All effective distance learning programs depend upon the “three legs” of good learning materials, effective student support, and efficient logistics (Daniel 1996:40). The production of learning materials can be a costly activity, and is therefore the area in which good management can do the most to reduce program costs. The purchase of existing course materials from another distance education institution can be a good strategy for beginning a distance education program because the materials are proven, readily available, and likely to facilitate local accreditation. However, transporting an effective distance education course from one cultural context to another usually requires some retooling and adjusting to the new culture. This should ideally be accompanied by a student performance feedback loop so course managers can ascertain whether the adapted course is working properly.

In the longer run, local production of course materials is frequently the best approach. In addition to possible cost savings, it is a good way to promote local staff ownership of the distance education program. In most cases, the buying of course materials is not an attractive option unless the number of students for the course is low and local course development costs are high (Rumble 1997:90). Generally accepted practice is to produce learning materials through the use of design teams in which each member contributes a specific skill. Design teams vary in composition but often include a content expert, an instructional designer, a communications or media specialist, an editor, and a peer reviewer (see Box 3).

Student support is universally underscored as the most critical factor influencing student success (Keast 1997; Moore and Kearsley 1996). Timely feedback to students on their performance, on-site tutoring, and access to library and laboratory materials are essential for student achievement in tertiary distance education programs. Without it, student drop-out rates will rise and eliminate any advantages of cost-effectiveness for distance learning. The importance of student support for successful learning is illustrated by the following experience. When the University of South Africa

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17 See also Krebs (1998).

18 Recent experience in Kenya and South Africa suggests that it costs roughly $40,000 to develop each new tertiary course when satellite, computer, and CD-ROM systems are used, although equivalent costs in Europe are much higher.

19 For a more extensive discussion of course design teams, see Rumble (1997).
discovered in 1986 that pass rates for its physics courses were only 20 percent, it responded by strengthening student support services. As the result of adaptations such as second-chance assignments, more tutorial support, and a decrease in the ratio of students per staff member from 201:1 in 1986 to 112:1 in 1997, the pass rate doubled to 40 percent (Cilliers and Reynhardt 1998). As a general guideline, 25 students per tutor is suggested for study centers that are easily accessible to students (Rumble 1997:108). Where students are scattered and travel distances are far, smaller groups and more tutors will be needed. Notably, many distance education programs make evening and weekend use of the laboratories and classrooms of other public educational institutions for their tutorials and practical work, thereby eliminating the need for wholly owned facilities.

Efficient logistics is the third determinant of effective tertiary distance learning programs. Study materials must be distributed in a timely fashion. Feedback on student performance (e.g., grades, comments) should be communicated without delay in order to sustain student motivation and guide learning. A well-managed system of student records (e.g., courses taken, credits earned, requirements fulfilled, materials sent, assignments completed, bills paid, addresses changed) provides a solid foundation for efficient logistics. Fortunately, computerized management information systems (MIS) today make these tasks much easier and more accurate than when these records were maintained by hand. However, experience with computerized MIS is not yet widespread in Africa (South Africa is an exception). Where it exists, inadequate computer maintenance has often interrupted system use and offset the expected efficiencies. The inability of public institutions to pay competitive salaries to retain trained staff has been a second obstacle to expanded use of computerized MIS.

For tertiary distance learning to increase enrollments and broaden access, all tertiary academic programs will need to be converted into a modular/credit system. Under this system, a student earns a certain number of credits for each successfully completed course and receives a degree when the required total number of credits has been accumulated. Conversion to a modular/credit system is a laborious but vital process. Self-paced instruction, lifelong learning, and student mobility between residential and distance programs are all based on assumptions of a modular/credit system, and tertiary distance education cannot function without it.

POLICIES FOR CAPACITY-BUILDING

Capacities for planning and for management are more important in distance learning than in traditional face-to-face education. This is because communications with a geographically dispersed student body are more expensive and time-consuming than in the classroom, and mistakes are therefore more difficult to correct. Yet the skills required to mount effective distance education programs are not hard to acquire. In most cases, several months of intensive instruction for academic staff with previous teaching experience are sufficient. In addition, Internet-based courses in distance education techniques are increasingly available (see Attachment 2).

Lessons from experience indicate that staff training often receives insufficient attention (Bates 1997:11). Competent staff are the foundation stone upon which all other distance education activities are erected. Yet in the effort to get distance learn-

20 The estimated world average is a 40 percent drop-out rate for distance education students, although some think that this rate is even higher; in Africa, the rate is often more than 50 percent (Moore and Kearsley 1996:158; Murphy and Zhiri 1992:12).

21 Some of the better known programs for training in distance education are run by the University of Southern Queensland, Australia; the Télés université at the University of Quebec and the University of British Columbia, Canada; the Université Panthéon-As, Paris II (DESS) and the RESAFAD diploma program (in partnership with certain African universities) in France; the Indira Gandhi National Open University in India; the University of South Africa; the Open University and the International Extension College at the University of London in the United Kingdom; and Pennsylvania State University and the University of Wisconsin in the United States.
Box 4. Distance Education Partnerships

Partnerships are a prevalent strategy for capacity-building in distance education. The most common areas of collaboration are the sharing of instructional materials, development of new courses, training of teachers and managers, program evaluation, experimentation in use of technology, sharing of experience on common policy issues, widening of access for individual learners through credit interchange, and mutual recognition of credit. By working together, institutions can pool limited resources and create economies of scale that will enable activities to be undertaken collectively that could not be done individually. To operate effectively, partnerships must fulfill various practical requirements. Institutional incentives to cooperate must exist. So should the necessary legal authority to do so. Inexpensive communication channels are equally important. Finally, an acceptable joint management mechanism is needed.

One example of an effective partnership is a consortium of distance education programs from six countries in Africa and Latin America known by the acronym CAERENAD (Centre d’application, d’études, et de recherche en apprentissage à distance). Initiated by the “Tele-université” at the University of Quebec (Canada) and funded by the Canadian International Development Agency, CAERENAD joins university distance education programs from Brazil, Chile, Costa Rica, Mauritius, Senegal, and Canada in the sharing and common development of course materials for distance learning programs in teacher training, administration, the environment, and communication. Accessible through the Internet, these materials are available in English, French, Spanish, and Portuguese. In addition, the network offers reference and training resources for pedagogy, technology, applied research, and program design.

An African illustration of good partnership is the University of the Indian Ocean. This new regional institution, sponsored by five island nations off the east coast of Africa, launched its first degree program, a master’s in business administration, in April 1999. Instruction is in both French and English, the languages of the countries involved: the Comoros, Madagascar, Mauritius, Réunion, and the Seychelles. The university has no physical campus. It functions as a graduate training network based on a rational division of labor among eight collaborating higher education and research institutes that are linked by electronic mail and offer graduate programs on a distance education basis. Based at St. Denis, Réunion, and supported financially by the European Union, the University of the Indian Ocean serves two countries that have no university of their own. Plans call for an expanded graduate curriculum to focus on skill-building for private sector development, including programs in environmental issues and in renewable energy. The possibility of organizing a similarly styled university to offer undergraduate degrees to the Portuguese-speaking islands of Cape Verde, the Canaries, the Azores, and Madeira is under discussion.
Box 5. The University of Namibia: A Dual-Mode Institution

Namibia is a country with twice the area of Germany and a dispersed population of 1.5 million citizens. Half the population lives 700 km or more from the capital city of Windhoek. After independence in 1990, the country determined to expand educational access, including at the tertiary level, among these underserved communities. Distance learning plays a key role in this strategy, with four separate institutions involved in the provision of service. The foremost of these is the University of Namibia.

The university's degree programs at a distance are provided by its Centre for External Studies (CES). The Centre’s programs are fully integrated within the university. Its students are selected by the same criteria, pay the same tuition fees (US$335), take the same examinations, and receive the same degree. The centre enjoys faculty status within the university, its director stands on par with faculty deans, and it manages its own budget of some US$300,000 annually (excluding salaries). Student fees cover almost all of the centre’s nonsalary costs.

At present, the University of Namibia enrolls 1,014 distance learning students. They represent 31 percent of the university’s total enrollment. Courses offered include bachelor of arts in education and business administration and bachelor of science in nursing. Notably, 77 percent of distance learning students are women, perhaps reflecting traditional gender biases in the nursing and teaching professions. The academic performance of distance education students is respectable in light of their disadvantaged circumstances, although below that of full-time students. Distance education pass rates were 50 to 60 percent, whereas pass rates for residential students were 70 to 90 percent.

The CES houses a Materials Development Unit, an Instructional Design Unit, a Student Support Unit, and an Administrative Unit to handle publications, student, records and consultants’ contracts. Student support is provided through nine regional centers that handle registration and fees, academic counseling, face-to-face tutorials, library resources, examinations, and local advertising. Staff includes 15 academic staff, 10 administrative staff, 18 regional center staff, and some 130 part-time course writers, face-to-face tutors, and marker-tutors who grade examinations and provide students with detailed feedback on their performance. The staff-to-student ratio is roughly 1:67, which, although somewhat below international standards, provides CES with the capacity to expand future enrollments. CES is led by a director who works closely with a management committee composed of key CES supervisory staff. Academic programs are coordinated with sponsoring faculties such as education, health sciences, and business administration through faculty liaison committees and are formally overseen by the university's senate. Interestingly, a Board of Studies (with membership drawn from CES staff, collaborating university faculties, the Office of the Registrar, and several non-university employers) regulates CES academic activities and also functions as a committee of the university senate.

In 1999 CES conducted a self-assessment and used the results to develop its strategic plan for the next five years. This assessment highlighted the importance of experienced professional leadership, the value of understanding and support from senior university management, and the growing return on the centre’s careful investments in staff development. Future plans call for maximizing enrollments around a limited number of carefully chosen degree programs, a modest increase in short-cycle courses, and continuing investment in professional capacity-building.
ing is accepted, it is possible to identify institutional capacity "gaps" for specific countries. These gaps become prime candidates for attention to capacity-building. For example, Côte d'Ivoire might appropriately give its attention to establishing private distance education and university-based Internet service providers before considering more advanced initiatives. Likewise, universities in Mozambique and Senegal might consider establishing a distance education research unit as their next capacity-building step.

Partnerships are a particularly good way to build local capacities in distance education. Distance education is well suited to the use of institutional linkages and collaborative networks. Given the time and expense required to develop good course materials, it would appear an obvious solution for African universities to work together in producing these materials, perhaps in association with an experienced institution located outside the region. One current example is the RESAFAD program (Réseau Africain de formation à distance), which joins Benin, Burkina Faso, Guinea, Mali, and Togo with a university support network in France to produce distance learning materials for the in-service training of primary and secondary education teachers. Another is the TELESUN program in Cameroon in which five European universities collaborate with the University of Yaoundé in action research to test and validate a system of televised multimedia science teaching. Other examples include the sharing of course materials between the University of Nairobi and the Open University of Tanzania and a collaborative bachelor of education program between the Zimbabwe Open University and the University of Botswana.

In Southern Africa, a promising experience in regional partnership is under way. It is led by Technikon, SA, South Africa's distance learning polytechnic, which enrolls 80,000 students and offers 220 different certificates and diplomas. This partnership is the Technology Enhanced Learning Initiative for Southern Africa (TELISA), which seeks to work regionally through public and private partnerships to expand community access to educational information technology and to the Internet. Activities also include non-educational applications in the areas of business, marketing, and community development. TELISA is establishing information clearinghouses in Southern African countries to support educators' access via Internet to curriculum information relevant to participating countries and institutions. In addition, it works with community groups to facilitate the introduction of on-line community learning centers and training of local educators to improve access to skills and resources. Community centers are operational in Kgautswane, South Africa, and at the Institute of Extra-Mural Studies of the National University of Lesotho. Three others are under implementation in South Africa.

In practice, most new distance learning programs have benefited from a "mentoring" partnership with a more experienced institution. In some cases, local partnerships with private firms such as network providers or equipment suppliers could ease the management burden and provide valuable access to marketing expertise. Likewise, long-standing efforts to establish a regional open university serving all of Sub-Saharan Africa may receive the necessary impetus as e-mail and the Internet enable institutional partners to participate fully and effectively in such initiatives at affordable cost. Notably, creation of a regional open university was one of the few distance education recommendations presented in the Bank's 1988 education policy paper for Africa. The idea remains valid today.

**WHAT INSTITUTIONAL MODEL TO CHOOSE?**

What institutional mechanisms can be employed to deliver distance learning services? Four possibilities exist: dual-mode, single-mode, franchised international program, and direct unfranchised international provision. The advantages and disadvantages of each form are discussed below. It should be noted, however, that in practice many of these distinctions will blur and fade. "Evidence

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21 The South African Institute for Distance Education (1999:27) provides a list of practices judged to be essential for the development of successful partnerships in distance education.

22 For further information, see the TELISA Web site at http://pgw.org/telisa.
Box 6. Open University of Tanzania: A Single-Mode Institution

The Open University of Tanzania (OUT), begun in 1993, has just graduated its first group of 136 students. Its mission is to upgrade teacher qualifications at the secondary level, expand access to higher education, and lay the foundation for a culture of lifelong learning. Initially using study materials developed by the University of Nairobi, four degree programs were launched. Later, additional study materials obtained from the University of Abuja, Nigeria; Makerere University, Uganda; the Indira Gandhi National Open University of India; and the University of Hong Kong enabled an expansion to seven degree programs (B.A., B.A. with Education., B.Com., B.Com. with Education., B.S., B.S. with Education., L.L.B.). At the same time, 74 course titles have been written by local academicians from other universities hired on a part-time basis. OUT is run by 35 academic staff and 50 administrative staff, but it also makes extensive use of short-term consultants and private sector contracts for services such as printing. Instruction is based mainly on the use of printed materials; however, all courses for the B.A. with Education are now on audio cassettes, along with 100 audio cassettes available as study material for other courses. An OUT production center for audio cassettes is nearing completion. OUT’s recently established Institute of Educational Technology will conduct research on distance education and assesses the feasibility of distance education technologies under local conditions.

OUT enrolls 5,700 students and operates 21 regional study centers to support them. Notably, students have established an additional 56 local study centers on their own initiative. Live lectures are videotaped and sent to these centers for viewing by students. Study materials are also made available through local branches of the Tanzania Library Services and other institutional libraries. In addition, OUT functions as a project site of the African Virtual University and thus has access to AVU’s digital library. Tuition fees equivalent to US$185 are charged for each academic year. A foundation course is offered to enable unqualified applicants to acquire the qualifications they need to enter degree studies.

from single and dual-mode universities, and from conventional campuses, suggests that we are approaching the point where there is no longer a clear division between conventional and distance education. University education will be conducted by various means at different times and places according to the requirements of different groups of students” (Mugridge 1992:154). Mirroring a similar trend in Australia, South African universities are increasingly operating on a “mixed-mode” basis in which students combine face-to-face and distance learning classes with on-campus residence. Even if such blurring of delivery modes occurs in practice, it is helpful to distinguish them as conceptual categories.

A dual-mode institution offers both classroom instruction and distance education programs. The dual-mode model appears best suited for enrollments in the 10,000 to 20,000 range; however, with capable management, the financial break-even point can be pushed down to enrollments as low as 5,000 or fewer. Where traditional tertiary institutions can be persuaded to view distance education as a serious alternative of comparable quality, dual-mode institutions can also effectively serve enrollments of more than 20,000 students.

The dual-mode approach possesses numerous advantages. It makes use of and is supported by an existing academic community and research capacity. Classroom and distance instruction are based on common materials, and performance is evaluated using common standards. It can be introduced gradually as resources permit. Where an academic credit system is employed, students can move back and forth between distance and classroom study or pursue a combination of the two. In smaller institutions, this approach enables a broadening of curriculum and allows courses to be taught when academic staff are on vacation or when academic positions are unfilled.
The main disadvantage of dual-mode instruction is that efforts to introduce distance learning approaches within a traditional tertiary institution based on face-to-face teaching are likely to encounter stiff resistance to change among the existing academic and administrative staff. In a number of African institutions, administrative rigidities, limited management autonomy, and lack of program flexibility add to the challenge of promoting such changes. Often, the inclusion of special performance criteria that recognize staff contributions to distance education programs, together with financial incentives for the additional time required, can help to overcome this conservatism.

Distance education within a dual-mode university can be organized in one of two ways. One is the specialist institute in which a core group of specialist staff members, drawing upon content expertise from university departments, undertake to design courses, produce materials, and oversee their distribution and use. An effective example of this approach is the National Distance Education Centre at Dublin City University in Ireland. A second approach is the coordinating unit, which functions as a liaison between students and university departments that directly produce and offer distance education courses. This model has been employed at the University of Zambia (Ng’andwe 1995). Because it often lacks decisionmaking power within the institution, this latter approach has tended to be less effective.

The single-mode institution is a wholly dedicated distance learning institution. Where student

### Box 7. The Growth of Virtual Universities

The late 1990s have witnessed a major innovation in the provision of tertiary education: the so-called virtual university. The term refers to the electronic provision of tertiary instruction through a combination of one or more technologies such as video conferencing, interactive e-mail, satellite transmission, and on-line libraries via the Internet. The virtual university has no campus, no residential students, limited face-to-face tutoring, and no athletic or social activities.

The rapidly expanding numbers of virtual universities include the following: ISTEM Virtual University in Monterrey, Mexico; African Virtual University (World Bank); Francophone Virtual University (Agence universitaire de la francophonie); Western Governors University (United States); University of Phoenix (United States); National Technological University (United States); California Virtual University (United States); Penn State World Campus (United States); Automotive Virtual University (United States); British Aerospace Virtual University (United Kingdom); the University for Industry (United Kingdom); Global Virtual University (New Zealand); and the Virtual University of the Asia Pacific. The British University for Industry is representative of the approach being followed. The university, described by its vice chancellor as “a hub, a cataloguer, a broker, and a promoter,” seeks to create the desire to learn and an awareness of learning opportunities—and thus a workforce capable of meeting industry’s skill requirements. It will not hold degree-awarding powers, nor will it create courses. Instead, it will commission material from a range of providers, including universities, whenever a gap is found in existing offerings.

In the United States, the Directory of Accredited Distance Learning Degrees lists 750 degree programs offered by 300 American colleges and universities. In 1997, the market for Internet-based learning was $1.98 billion and accounted for about 3 percent of the total training and education market. By 2001, Internet-based learning is expected to expand to a $1.8 billion enterprise that covers 15 percent of the training and education market. The cost of establishing a high-quality, totally virtual university, where students and faculty would be located individually anywhere in the world, is calculated to be $15 million—less than the cost of constructing a classroom building. In the years ahead, it seems probable that the most successful of these virtual universities will become global operations, offering instruction to any student in any country who has a modem and a credit card.

Sources: Morri (1997); Phillips (1998); (Turoff 1997).
admissions are not selective, this model is usually called an “open university.” Its advantages include a strong specialist staff, the absence of institutional resistance to a new and different form of pedagogy, and the institution’s potential to serve students from more than one country. Its principal drawbacks are that it requires a sizable initial investment to be properly established, considerable political will must be mobilized to do this, and its graduates may be viewed as separate from, and therefore inferior to, those of the existing residential institutions. Single-mode universities operate in South Africa, Tanzania, and Zimbabwe.

Under a **franchised international program**, a foreign provider of distance education programs enters into partnership with a local tertiary institution to offer these programs on a joint basis. This is often done as a commercial venture. The local institution uses course materials developed and copyrighted by the foreign provider but takes responsibility for local logistics, student support, and management. Fee income is shared between the two institutions. The franchise approach possesses several advantages. It does not require a lot of local expertise in order to get started, and therefore can be initiated rather quickly. The course content may be more attuned to international trends and requirements. It consequently may be easier to obtain course accreditation. And it can be supported by international technical (and possibly even financial) assistance. Among its disadvantages are that it may be less adapted to local needs, it may not be very accountable to local quality assurance mechanisms, and it may be more expensive than locally developed programs. One example is the master’s program in agricultural development offered by Wye College in the United Kingdom. A variation on this approach is the in-service master’s program in business administration contracted from the Open University in the United Kingdom by the governments of Eritrea and Ethiopia for their senior civil servants. The franchise model is quickly expanding. It was recently estimated that for the United Kingdom alone, franchised courses now account for 140,000 foreign students and $410 million in revenue (Bennell and Pearce 1998).

**Direct unfranchised international provision** is just beginning to emerge. In this case, an established distance learning facility or “virtual university” offers courses internationally, generally using the Internet and interactive e-mail (see Box 7). In this case, all that the student requires to gain access is a computer, a modem, an Internet connection, and a credit card. Master’s programs in engineering transmitted to North American and Asian students via satellite by the National Technological University in the United States are one such example. In Africa, the University of South Africa’s new Web-based virtual university, called Students-On-Line, can be reached by anyone on the African continent who has an Internet connection. The range of directly provided, international distance education courses is expected to expand rapidly over the next several years.

The advantages of this model are that little or no action is required by local governments or institutions and that students can study without leaving home or job and without having to raise the funds necessary to study abroad. Its disadvantages are its possible lack of quality control and the associated risk of disreputable providers, possible differences in “educational culture” between sending and receiving societies (Moore 1994:189), the absence of local tutorial support, and fee scales that may prevent access by all but the most wealthy students. In the long run, the risk of unfranchised international provision is that tertiary education may become another entrenched commodity that developing countries must import from the developed world, thus creating a new and more effective form of cultural imperialism. This gives developing countries an added incentive to cultivate distance education capacities, and to work together in doing so.

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24 See Farrell (1999). Also, the U.K. Committee of Vice-Chancellors and Principals and the Higher Education Funding Council of England have commissioned a study on the impact of virtual and corporate universities on higher education in the United Kingdom. A report is expected by the end of 1999.

25 For example, 14 of North America’s largest research universities are working together to market their distance education courses through a central directory on the World Wide Web that lists all of their on-line programs (www.R1.edu). Also, the U.K. Open University has established an affiliated “United States Open University” that will offer the Open University’s proven approaches to an American market in late 1999.
In selecting among these four institutional models, market analysis is recommended as an essential part of the planning and decision-making process. Typically, market analysis looks at four areas: student demographics (age, geographic distribution, qualification desired, occupational interest, socioeconomic status); competition (alternative services available to students; alternative delivery modes for providers); the regulatory environment (quality standards, licensing, accreditation, taxation, telecommunications); and the students' ability and willingness to pay (Willis 1994:79).

A market survey of a representative portion of the target population can yield essential information about the scope of demand for different course levels as well as for the type of course content that is most sought after. The Bangladesh Open University, for example, interviewed 16,000 persons before making final plans for course offerings. Because distance education requires a significant up-front investment in the development of course materials and tutorial support, market analysis is important to maximize the success of initial strategic choices and to reduce the possibility of misguided educational initiatives. Many of the established open universities (e.g., India, Hong Kong, Bangladesh) have experience in conducting market analyses and could be contacted for guidance and technical assistance in this area.

WHAT MANAGEMENT CHOICES MUST BE MADE?

Once an institutional mechanism for the delivery of distance learning programs is chosen, an implementation framework is needed to manage day-to-day activities. This implementation framework should be guided by a mission statement that has been developed to orient the overall undertaking. Experience indicates that it is usually best to start with a small number of high-quality distance education courses that respond to significant areas of public demand identified by a market survey. In choosing courses, careful consideration also must be given to the country's employment needs and related job skills.26

The biggest single challenge to the establishment of distance education programs within existing tertiary institutions is attitudinal barriers and institutional resistance (Evans and Nation 1996:150; Keast 1997:42; Mugridge 1992:54). Professional opposition arises from beliefs that educational quality will not be maintained, that students will not adapt, and that time-tested methods are best. In addition, personal worries also play a strong role: fear of change, fear of new technology, job insecurity, and professional reputation. Institutional resistances emerge when established procedures must be changed, accepted standards are not applicable, organizational roles or units need to be transformed, or new entities may compete for limited budgetary resources. These are, in fact, exactly the types of change necessary to establish distance education. In its fully developed state, distance learning requires a substantial change in academic culture: from a tradition of individual scholarship, research, disciplinary orientation, academic freedom, faculty autonomy, collegiality, and independence to a new culture characterized by an institutional mission, teamwork, interdisciplinary and problem-solving approaches, conflict resolution, management, and accountability. How can such changes in institutional culture be initiated?

When a traditional tertiary institution is involved in setting up distance learning programs, a senior-level "champion" is frequently required to initiate the necessary changes within a resistant academic culture (Moore and Kearsley 1996:234). This is ideally a person of status and credibility who is personally persuaded of the merits of distance learning approaches. In addition, the change process can often be accelerated somewhat by clear policy statements from top political leaders and appropriate state interventions to underscore the government's commitment to the new policies.

In practice, much of an institution's resistance to distance learning may derive from rigidities in its operational set-up and administrative procedures. These rigidities are bound up with the assumption that tertiary education is undertaken

26 For a good discussion of how to undertake "environmental scan analysis" to target distance learning programs effectively to the local market, see Willis (1994:72ff).
largely by students who have recently completed secondary schooling and who are now preparing to enter the workplace. These operational systems inhibit academic staff from exploring new approaches to teaching and learning in response to the growing diversity of student needs and circumstances. In this context, greater administrative flexibility is not merely a desirable "ideal." It is a necessary prerequisite for effective competition if tertiary institutions are to respond to the changing demands of individuals, companies, and governments that will be deciding whether or not to buy the institution's services.\textsuperscript{27}

What does a call for greater administrative flexibility mean? It means retooling procedures so that academic staff can allow students to do one or more of the following: register and enroll throughout the year; take courses of any length and accumulate these towards broader qualifications; combine courses in different ways to create different learning programs; exit programs at many different points; postpone studies for any length of time; study at sites that are convenient and accessible (including home and the workplace); study at times of the day and week that fit with their lifestyles; write examinations and undertake other assessments throughout the year; and pay at different times and in different ways.\textsuperscript{28}

In addition to insufficient administrative flexibility, assessments of distance education experience indicate that several other mistakes are also common in the course of planning for implementation. These include premature selection of technology; emphasis on technical planning and neglect of educational planning; failure to consider market-related factors such as consumer demand, competing alternatives, and the regulatory environment; and insufficient identification and use of available program resources (Willis 1994:69).

Only after a market-oriented educational plan has been drawn up should the choice of technology be addressed. The mix of technologies to be used for providing distance education is a key implementation decision, because it has direct implications for program organization, staffing, and costs. As noted earlier, the choice of technology has been shown to have relatively little effect on learning. Thus, this choice should be guided by what works reliably in the local environment, and by local costs. The choice of technology should be followed by a technology development plan that details infrastructure requirements, hardware needs, training necessities, cost estimates, and investment priorities for teaching, research, administration, and community service (World Bank 1998b:32).

The next important set of management decisions shapes the program's organizational structure and staffing. These decisions should, to the extent possible, seek to build upon existing strengths, recognize the need for industry and employer liaison, and include some capacity for social marketing of the distance education programs. The value of a small specialist coordinating unit for national distance education programs located on the campus of an existing university along the lines of the National Centre for Distance Education in Ireland has been mentioned. With regard to dual-mode initiatives, experience teaches that it is important for the head of distance learning programs to be accorded academic status equivalent to that of faculty deans, that the head have a seat in the institution's decisionmaking forum, and that a separate budgetary item for these programs be under the head's direct control. Without such safeguards, the distance education program will take much longer to establish itself.

Another lesson from experience is that effective implementation of tertiary distance education programs requires permanent attention to staff development. New roles and skills are necessary when academic staff move from teaching to tutoring. Identified training priorities include strategic management, instructional design, communications, training-of-trainers methods, and pedagogical use of technology. As noted, staff training is frequently underfunded in the effort to reduce costs, and this practice can be counterproductive. A shortage of trained staff and of training capacities can lead to

\textsuperscript{27} Neil Butcher, personal communication, May 1999.

\textsuperscript{28} Neil Butcher, personal communication, May 1999.
a transitional period of poor-quality distance education services, which, in turn, can undermine the initial credibility of the new program. One knowledgeable practitioner has suggested that each staff member should spend five days a year on professional development and another five days a year on technology skills (Daniel 1996:157).

Various training programs on distance education currently operate on the continent. Within anglophone Africa, a diploma-level course in distance education is offered at a distance by the University of South Africa, and a certificate-level course has recently been introduced by the Open University of Tanzania. Within francophone Africa, preparations are under way at the Centre de Formation à Distance of the Université du Bénin, Togo, with support from a UNESCO chair, to offer a troisième cycle program in distance education. The RESAFAD program already offers a diploma program, taught at a distance, in multimedia communications (diplôme d’université de communicateur multimédia).

Governance and accountability arrangements for tertiary distance learning programs are also important considerations and can produce a substantial pay-off. High participation levels of stakeholders (i.e., staff, employers, students) generate more successful programs (Daniel 1996:129). In South Africa and Indonesia, for example, active involvement by these groups in planning and evaluating distance learning programs has helped to increase their educational effectiveness. Where a team-based approach to course development is adopted, a more collegial style of institutional governance has proved to be preferable.

SUMMARY CONCLUSION

Distance learning, incorporating a judicious use of new information and communication technologies as they become increasingly available in Sub-Saharan Africa, promises to provide an important part of the solution to the continent’s growing demands for expanded access to and improved quality of tertiary education. Although each country will need to craft its own approach to the establishment of tertiary distance education programs and institutions, considerable worldwide experience is available to inform policymaking and planning in this area. This experience suggests that the following general guidelines can help African nations to build successfully the capacities they need to support effective tertiary distance education:

- Assess current good practice from other countries and develop explicit national strategies for tertiary distance education and associated technology development that are solidly based upon existing local capacities, which in some cases are significant.
- Support this strategy with an aggressive start-up phase of institutional and human resource capacity-building activities that are incorporated within other education sector projects. Partnerships with overseas distance education programs and with local industry or other training institutions can improve the quality and efficiency of this capacity-building process.
- Design (or re-engineer) organizational structures to accommodate the unique requirements of distance education in contrast with conventional teaching. Capacities for course design, student support, assessment of learning, and management of service delivery are among the essential components.
- Integrate distance education courses and certifications into the existing tertiary education system as fully as possible, recognizing that choices represent a continuum ranging from campus-based face-to-face teaching to home- or office-based learning by means of one medium or more. For many African countries, a dual-mode approach in which distance learning programs are incorporated within existing tertiary institutions would appear to be the most cost-effective and manageable approach. This integration should also include acceptance of distance education degrees as employment qualifications for the public service.
- Use printed materials as the main medium of instruction, invest in good-quality course design and study guides, and strive for strong and effective student support services.
• Use new information and communication technologies to improve management efficiency and enhance educational quality rather than to expand access; pay special attention to library transformation in this process.

• Limit course offerings to areas of high student demand, and develop only at the pace permitted by resource availability and management capacity.

THE FUTURE

What can African governments, and particularly their ministries of education, expect if they make an effort to develop their tertiary distance education capacities? Perhaps a glimpse of the future of global tertiary education will help to answer the question.

Tertiary enrollments will expand rapidly in the years ahead. The recent “massification” trend of tertiary enrollments in the developed countries will continue and expand to engulf the developing world as well. Lifelong learning will become the global norm as both countries and workers strive to build and maintain a competitive edge. Students of all ages will start, interrupt, and restart studies at any time, pursue them on a full-time or part-time basis, and do so through a combination of self-study, digital learning, and face-to-face participation in learning activities. Learning will be greatly individualized and self-managed. For this reason, a highly professional student guidance system—in which personal counseling by tutors forms an important component of teaching—will become a central element in tertiary education.

Tertiary education in the future will be based much less on academic disciplines and more on cross-cutting topics or trans-disciplinary issues. Great emphasis will be placed on ability to learn independently, to communicate effectively with others, to collaborate productively in teams and groups, to be culturally and socially sensitive, to be flexible, and to accept social responsibilities. Media competence will become a universally required skill. The goal will be to prepare students for the knowledge economy where they will work in “virtual” companies, organizations, committees, and project teams (Peters 1999).

Research will no longer be primarily the domain of universities, and it will diverge increasingly from the structures of university education. It will become an interactive undertaking involving many types of knowledge producers who work together “virtually” in networked teams that form, dissolve, and regroup as necessary to tackle complex trans-disciplinary problems. Disciplinary science will gradually give way to “research in the context of application” aimed at understanding and manipulating complex systems (Gibbons 1998:42).

New technologies will make university campuses obsolete. Students will use asynchronous multimedia communications delivered by the Internet and receive learning support through virtual libraries and on-line video conferencing. Students will design their own individual courses of study by selecting courses from a menu appropriate to their level of demonstrated learning. Education will be undertaken independent of time or place, when the student has time available for study. Courses will begin and end on a continuous basis. Dull administrative tasks such as paying fees, recording grades, monitoring attendance, assessing class participation, and charting progress will be performed automatically. Software will operate on voice recognition systems. Students will use portable computers with high-speed wireless access to the Internet as their main study tools. In this way, tertiary education will become truly personal and truly portable, possibly within the next 10 years (Downes 1998).

The crucial point to grasp from the vision presented above is that the development of national distance education capabilities is the stepping stone.
REFERENCES


Jensen, Mike. 1999. www3.sn.apc.org/africa. (Web site data periodically updated.)


Moore, Michael G. 1994. "Is There a Cultural Problem in International Distance Education?" In Melody M. Thompson, ed., Internationalism in Distance Education: A Vision for Higher Education. University Park, Penn.: American Center for the Study of Distance Education.


Mugridge, Ian, ed. 1992. Distance Education in Single and Dual Mode Universities. Vancouver, B.C., Canada: Commonwealth of Learning.


South African Institute for Distance Education. 1999. “Distance Education and Educational Technology Choices in South Africa.” Pretoria, South Africa: South African Institute for Distance Education. www.saide.org.za.


### Table 1. Projections for Tertiary Distance Education Enrollments in Sub-Saharan Africa

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Author’s calculations, columns 6 and 7.

(*) Data not available in UNESCO Statistical Yearbook (1998a). Where figures appear with an asterisk , they were obtained from World Bank data.

(+) This ratio conceals significant inequalities among racial groups.
GER = gross enrollment ratios.
### Table 2. Tertiary Distance Education Enrollments in Selected Countries

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### Table 2a. Females as a Percentage of Enrollments in Tertiary Education in Selected Non-African Countries

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</table>

Key:
1. Tertiary correspondence courses are provided in the country.
2. University contains a unit responsible for distance education.
3. Donor-supported project in distance education exists.
5. University contains a unit that conducts research on distance education.
6. Private provider of distance education courses exists.
7. Distance education courses are offered via radio.
8. A nongovernmental organization provides distance education courses.
9. University is an authorized Internet service provider.
10. Government has issued a formal strategy statement for distance education.
11. A national professional association of distance educators exists.
12. A university-level course on distance education theory/methods is taught.
13. Distance education courses are offered via television.
ATTACHMENT 2
INTERNET RESOURCES FOR TERTIARY DISTANCE EDUCATION

The following Web sites contain information and references on the organization and practice of tertiary distance learning. Many provide training materials or information on distance education training programs that are offered either in a residential setting or over the Internet.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Web site</th>
</tr>
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<tbody>
<tr>
<td>Commonwealth of Learning:</td>
<td><a href="http://www.col.org">www.col.org</a></td>
</tr>
<tr>
<td>Consortium International Francophone de Formation à Distance:</td>
<td><a href="http://www.ciffad.francophonie.org">www.ciffad.francophonie.org</a></td>
</tr>
<tr>
<td>Global Distance Education Net (World Bank):</td>
<td><a href="http://www.worldbank.org/disted">www.worldbank.org/disted</a></td>
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<tr>
<td>International Centre for Distance Learning (United Kingdom):</td>
<td><a href="http://www.icdi.open.ac.uk">www.icdi.open.ac.uk</a></td>
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<tr>
<td>American Center for the Study of Distance Education (United States):</td>
<td><a href="http://www.ed..psu.edu/acsde">www.ed..psu.edu/acsde</a></td>
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<tr>
<td>South African Institute for Distance Education:</td>
<td><a href="http://www.saide.org.za">www.saide.org.za</a></td>
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<tr>
<td>Tele-université Quebec (Canada):</td>
<td><a href="http://www.teluq.uquebec.ca">www.teluq.uquebec.ca</a></td>
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<tr>
<td>Institute for Distance Education, University of Maryland (United States):</td>
<td><a href="http://www.umuc.edu/ide">www.umuc.edu/ide</a></td>
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<tr>
<td>University of Wisconsin (United States):</td>
<td><a href="http://www.uwex.edu/disted">www.uwex.edu/disted</a></td>
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<tr>
<td>University of British Columbia (Canada):</td>
<td><a href="http://www.det.cstudies.ubc.ca">www.det.cstudies.ubc.ca</a></td>
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<tr>
<td>Distance Education Centre, University of Southern Queensland (Australia):</td>
<td><a href="http://www.usq.edu.au/dec">www.usq.edu.au/dec</a></td>
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<tr>
<td>Centre National d’Enseignement à Distance (France):</td>
<td><a href="http://www.cned.fr">www.cned.fr</a></td>
</tr>
<tr>
<td>African Virtual University (World Bank):</td>
<td><a href="http://www.avu.org">www.avu.org</a></td>
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<tr>
<td>Université Virtuelle Francophone:</td>
<td><a href="http://www.uvf.org">www.uvf.org</a></td>
</tr>
<tr>
<td>Réseau Africain de Formation à Distance:</td>
<td><a href="http://www.1id.jussieu.fr/resafad">www.1id.jussieu.fr/resafad</a></td>
</tr>
<tr>
<td>Distance Education and Training Council (United States):</td>
<td><a href="http://www.detc.org">www.detc.org</a></td>
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<tr>
<td>Fédération Interuniversitaire d’Enseignement à Distance:</td>
<td><a href="http://www.telesup.univ-mrs.fr/TELESUP/LaFIED">www.telesup.univ-mrs.fr/TELESUP/LaFIED</a></td>
</tr>
<tr>
<td>Distance Learning Resources, Cornell University (United States):</td>
<td><a href="http://www.dl.cornell.edu">www.dl.cornell.edu</a></td>
</tr>
</tbody>
</table>
ATTACHMENT 3
DISTANCE LEARNING PROFESSIONAL ASSOCIATIONS IN SUB-SAHARAN AFRICA

Association Africaine Francophone de Formation à Distance (ASAFFAD)

Monsieur I. K. Echene, President
08 B.P. 562
Abidjan 08
CÔTE D’IVOIRE
Tel: 225-21.14.42 Fax: 225-22.45.73

Distance Education Association of Tanzania (DEATA)

Dr. Egino Chale, Chairperson
The Open University of Tanzania
P.O. Box 23409
Dar es Salaam
TANZANIA
Tel: 255-51-668.992
Fax: 255-51-668.759

Consortium International Francophone de Formation à Distance (CIFFAD)

M. Denis Lopez, Directeur de l’EAD
Institut des Nouvelles Technologies de l’Information et de la Formation (INTIF)
15-16 Quai Louis XVIII
33000 Bordeaux
FRANCE
Tel: 33-05-56.01.59.05
Fax: 33-05-56.51.77.93

Ghanaian Distance Education Association (GHDEA)

Prof. Nathaniel K. Pecku, Chairman
TN Box TN 1863
Teshie-Nungua Estate
Accra
GHANA
Tel: 233-21-715.376

Distance Education Association of Southern Africa (DEASA)

Mr. Hennie Beukes, Chairperson
Centre for External Studies
University of Namibia
Private Bag 13245
Windhoek
NAMIBIA
Tel: 264-61-206-3757
Fax: 264-61-206-3016

National Association of Distance Education Organizations of South Africa (NADEOSA)

Ms. Jenny Glennie, President
P.O. Box 31822
Braamfontein 2017
SOUTH AFRICA
Tel: 27-11-403-2813
Fax: 27-11-403-2814
### Tertiary Distance Education and Technology in Sub-Saharan Africa

**West African Distance Education Association (WADEA)**

- Prof. Miranda Greenstreet, President
- Institute of Adult Education
- University of Ghana
- P.O. Box 31
- Legon
- GHANA
- Fax: 233-21-667.707

**Zambia Association for Distance Education (ZADE)**

- Dr. Richard Siaciwena, President
- Directorate for Distance Education
- University of Zambia
- P.O. Box 32379
- Lusada
- ZAMBIA
- Tel: 260-1-290.719
- Fax: 260-1-253.952

**Zimbabwe National Association of Distance and Open Learning (ZINADOL)**

- Mr. Naran Kala, Chairman
- 88 Norfolk Road
- Mount Pleasant
- Harare
- ZIMBABWE
- Tel: 263-4-301.832

**Open Learning and Distance Education Association of Eastern Africa (OLDEA)**

- Dr. Egino M. Chale, Chairperson
- The Open University of Tanzania
- P.O. Box 23409
- Dar es Salaam
- TANZANIA
- Tel: 255-51-668.992
- Fax: 255-51-668.759
OTHER PUBLICATIONS
IN THE EDUCATION AND TECHNOLOGY TECHNICAL NOTES SERIES


- Chile's Learning Network, M. Potashnik, Vol. 1, No. 2, 1996

- Cost Analysis of Information Technology Projects in Education: Experiences from Developing Countries, M. Potashnik and D. Adkins, Vol. 1, No. 3, 1996

- Interactive Radio Instruction: Twenty-Three Years of Improving Educational Quality, A. Bosch, Vol. 2, No. 1, 1997

- Teacher Education at a Distance, H. Perraton and M. Potashnik, Vol. 2, No. 2, 1997


