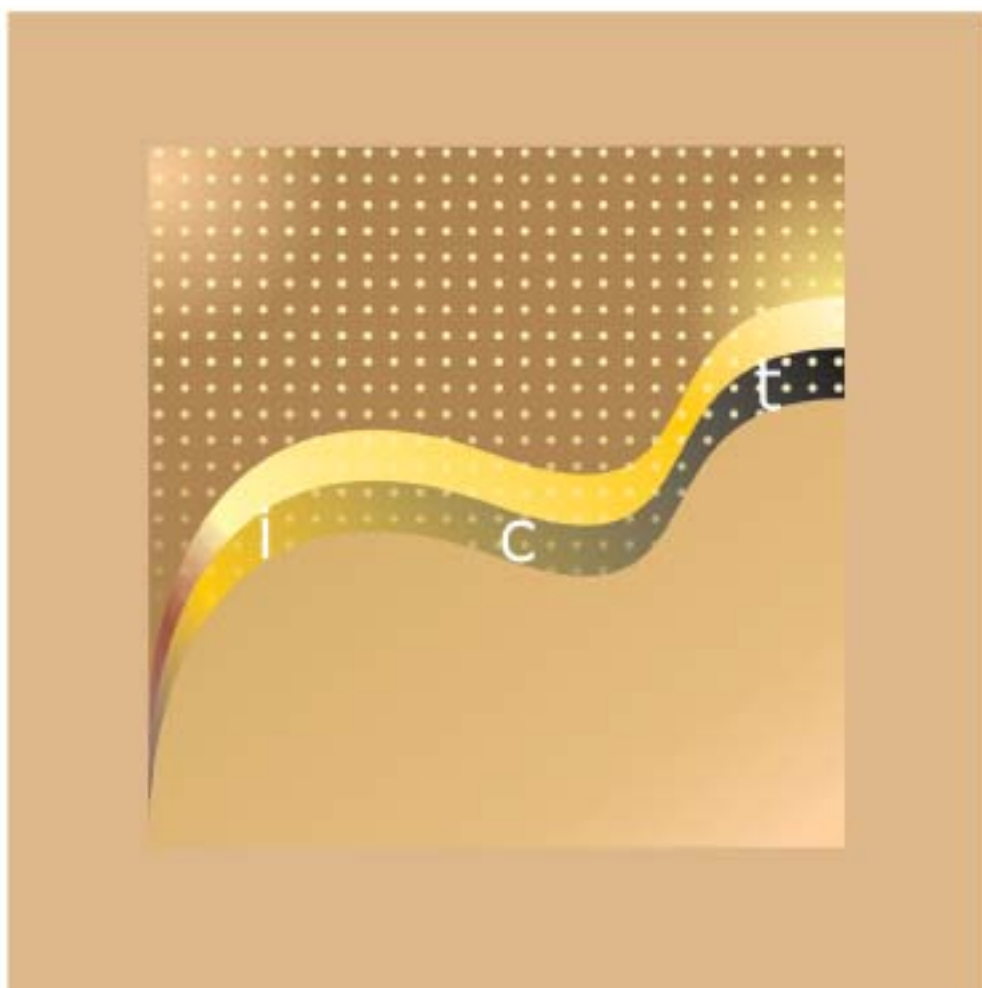United Nations Conference on Trade and Development

E-COMMERCE AND DEVELOPMENT
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CHAPTER 4.

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Chapter 4
ONLINE HIGHER EDUCATION:
ISSUES FOR DEVELOPING COUNTRIES

A. Introduction

Education, given its important role in the economic, political and cultural development of any State, is potentially one of the key sectors where information and communication technologies (ICTs) are applied. The opportunities presented by ICTs to change the content of and approach to learning as well as to extend the reach of educational institutions could have a profound effect on development. The Internet has the potential to overcome geographical and time barriers, and to allow students to study in any place at any time. Students in India are following a full technical degree online. Massachusetts Institute of Technology (MIT) course content is available online to anyone interested. Finnish students can complete their degrees by attending several universities without leaving home. Researchers, teachers and students are communicating globally.

While there has been much debate about the potential advantages and disadvantages of online higher education from a pedagogical point of view, its study from an economic and policy perspective is limited. Stakeholders in online higher education, such as a small university seeking to expand and improve what it offers, a ministry of education questioning how best to meet educational needs, an innovative entrepreneur or a student with limited resources wishing to receive higher education, are interested in finding out whether developing countries can benefit from online education, whether it can be developed locally and how much it costs. Stakeholders want to be reassured about the actual and potential value of online education, so as to assess whether it is worth the investment. Governments and institutions, particularly those in developing countries, want more information about online education, are concerned about what their role would be, and ask for possible strategies to maximize the benefits of online higher education.

The provision of education results from a combination of policy action and market processes within the context of any given economy and society. The purpose of this chapter is to inform the educational policy process by analysing how higher education services are provided and traded (either commercially or not) and outlining some of the trends resulting from the use of the Internet in the provision of higher education.

1. Some definitions

In order to clarify the variety of terms related to the subject, a number of definitions will be used in this chapter. The education sector includes basic education (the acquisition of literacy and numerical skills), secondary education, higher education (also known as tertiary education) and, more specialized professional training, as well as what is called "lifelong-learning" – the necessity to continually update and learn new skills through either corporate workplace learning or access to community education. In some countries, educational services, in addition to the above-mentioned instructional activities, also include activities designed to support educational processes (for example, educational testing services or student exchange programme services). Arguably, education also extends into other kinds of cultural and leisure activities – visiting a museum, watching a television documentary, going to the theatre or reading a book. In all of these areas, ICTs – and in particular the use of the Internet – are having an impact on why and how people access learning and what they use it for.

This chapter will be devoted to the higher education sector defined as post-secondary education, including both "technical and vocational education" (e.g. teacher training) and "education leading to a university degree" (namely, graduate, post-graduate and doctoral studies).[1] The reason for focusing on this sector is that international trade in higher education is more relevant for national Governments. In 1999, OECD countries' international trade in higher educational services was estimated at $30 billion (Larsen et al., 2002).

The potential uses of ICTs in education are vast: from radio and television programmes to the use of CD-ROMs, e-mails and the World Wide Web. Our analysis will focus on one concrete application: the Internet. The Internet has a number of uses within education: disseminating learning content, enabling communication between students and teachers, and engaging in and publishing research. The use of the Internet for education, including the use of websites and e-mail, has come to be known as online education.

Online courses frequently use the Internet in combination with other delivery modes. For example, they may require attendance at a two-day face-to-face seminar or may provide some course materials by mail. In this chapter we therefore recognize that online education does not necessarily entail 100 per cent online provision, and will consider online courses to be those where most of the content delivery and interaction is online.

E-learning is a broader notion than online learning and equally has no universally acknowledged or standard definition. In this chapter, we will use the most inclusive definition[2] of e-learning, which embraces every kind of teaching and learning situation using some element of electronic or digital resourcing (radio, audiocassettes, videocassettes, TV, personal computers, e-mail, Web) and considers online education a subset of e-learning.

Another concept is blended learning. As the name suggests, blended learning is learning that combines different modes of student engagement. In practice, the use of blended learning has been limited to the combination of online learning with face-to-face instruction.

Chart 4.1 provides an overview of these different concepts and how they will be referred to in this chapter. It also recognizes how ICTs have been applied both to complement face-to-face course delivery (e.g. by posting course information on the Web) and to support distance-learning courses (e.g. by providing e-mail communications between students and teachers).

2.   The focus of this chapter

This chapter provides an overall analysis of online higher education and its implications for developing countries. Beyond the scope of this chapter are

Chart 4.1
The e-learning continuum to online education
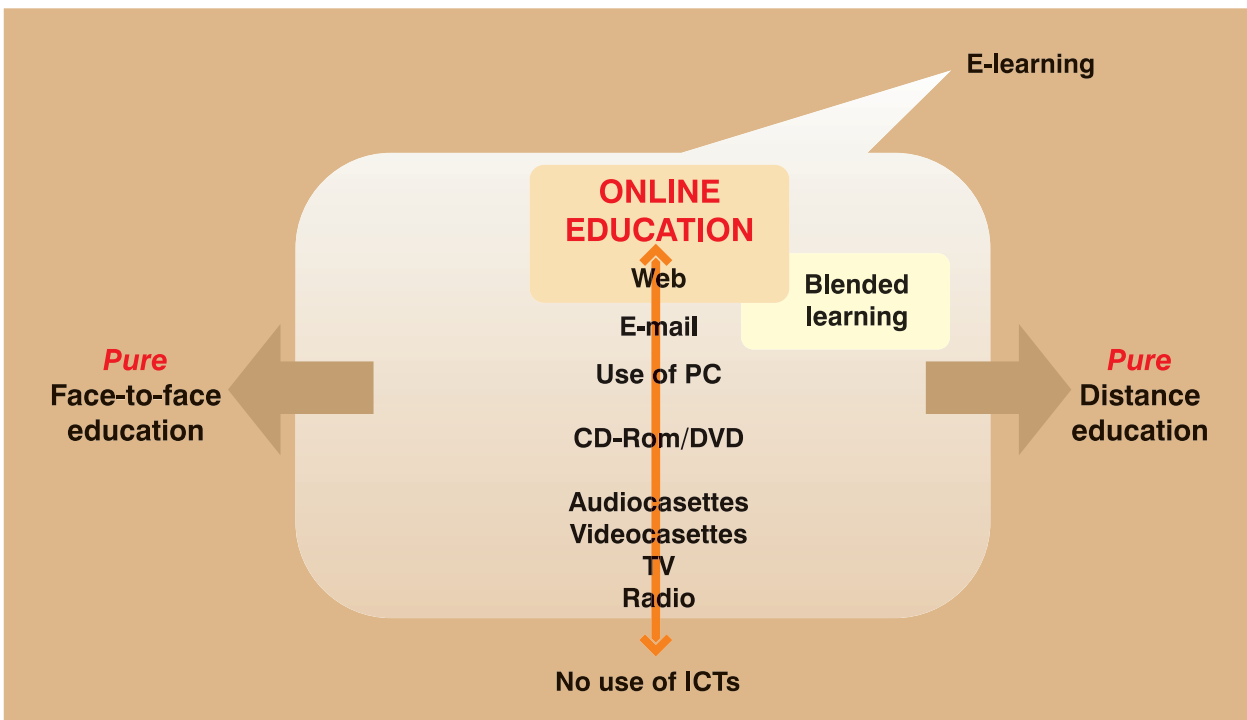
debates about the pedagogical effectiveness of online education or about the relative cost-efficiency of online education as opposed to traditional education.

The chapter benefits from a background survey on the economic costs and benefits of e-learning in institutions of higher education that was undertaken with a small sample of universities either currently engaged in, or planning to invest in, online education. The results of the survey (complemented with parallel research) are summarized in annex I. On the basis of the survey results, five models of the provision of online education have emerged, as described later. Additional information in the chapter comes from existing published materials and interviews with e-learning practitioners and educational managers.

The chapter is divided into four sections. Section A provides an introduction to what is understood by the term "online higher education". Section B discusses the importance of higher education for economic and social development and provides an overview of the higher education market. Section C explores the online higher education market. It begins by explaining current drivers behind the development of online higher education and providing an overview of this market and the effects of the Internet on the internationalization of higher education. After highlighting existing models of online higher education, the section reviews the economic rationale of investing in online education. In addition, it reviews the current status of the technology market and of the legal framework in which online higher education operates, as well as the influence of these two factors on the dissemination, and use of, and access to, higher education. The concluding section summarizes the impact of the Internet on higher education, and its implications, offering some recommendations for developing countries. It is hoped that the final conclusions will help to stimulate rigorous discussions on the use of online higher education and its impact on developing countries.

B.   The higher education market

1.   Education and economic growth

Education and human capital are recognized drivers of economic growth and social progress. According to a joint OECD–UNESCO study (2003), human capital has a stronger positive impact on growth in the group of developing countries covered by the study[3] than in OECD countries. Increasing the availability of human capital depends critically on extending years of study and completion rates beyond basic education. Access to and participation in education are more limited in developing countries, particularly in secondary and tertiary education, where costs can be prohibitively high.

Investment in education should be guided by how it can help eliminate social disparities and promote sustainable economic growth. Extending the benefits of education means addressing constraints in terms of both public and private resources, as well as institutional and individual resources. Public spending on education is an investment that benefits the poor (OECD–UNESCO, 2003). However, the extent of public funding is frequently contested as soon as participation in education extends beyond basic primary education: in other words, should secondary and tertiary education be subsidised by the State? Given these pressures, developing countries have resorted more to private financing than developed ones (OECD–UNESCO, 2003). Extending user fees as a means of cost recovery can be seen as a tool both for and against equity. It can be argued that tuition fees in tertiary education can be justified on the basis of the individual return on investment from higher education. However, the private costs of tertiary education can be a barrier to the inclusion of qualified students and is therefore an important policy concern if the policy aim is to eliminate social and economic disparities.

The externality of higher education means that when students invest in education they are not only benefiting themselves but are also increasing the general knowledge available in society and therefore contributing to economic and social development. Higher education serves a number of important functions that are central to the development of nations – training teachers, lawyers, engineers, and so forth. It also has a social and cultural function both in providing social cohesion and in transmitting certain important social values. These functions make education, to some degree, a public good. For this reason, even the most ardent liberalizers acknowledge that there is some role for the State to play in regulating higher education. However, in almost all other areas of discussion about higher education in general and its online provision in particular, there is considerable debate.

Box 4.1

Educational priorities and contexts

Low-income countries	Middle-income countries	OECD countries
Basic education for all by 2015	Develop secondary and tertiary education	Ensure quality of learning for all
Address inequities, particularly female enrolment	Competition with OECD educational institutions	Teacher shortages
Training of teachers	Develop access to ICTs	Continuous learning
Access to ICTs	Education statistics	Financing lifelong learning
Wealth growth	Demographic pressure	Increasing diversity of students
Quality and locally meaningful content and curriculum	Bridging inequality	Competitive educational services
Affordable teaching materials and textbooks	International recognition of accreditation	Attract new students
Use of mother tongue		Excellence
Community involvement		Promotion of ICTs

Source: OECD-UNESCO (2003); Johnston (2004); World Education Forum (2000).

As box 4.1 summarizes, educational objectives and priorities frequently depend on the level of economic development of a country. This is by no means an exhaustive summary (countries within the same region, do have different needs) but it provides an overview of the different priorities countries have as regards higher education and the different types of programmes they might concentrate on.

2. The higher education market

In 20 years, the number of higher education students has doubled, from 48 million to 102 millions

students a year. The greatest increase has been in developing regions (see chart 4.2 and table 4.1).

The different visions of the role of government in regulating and providing higher education have resulted in a number of overlapping, competing and complementary models of how and why higher education should be promoted and provided. During the period 1980–2000, a market model of higher education was in the ascendant both in developed countries (English-speaking countries and parts of Western Europe) and developing countries. In developing countries education in general has seen varying patterns of privatization. Whereas some developing countries have

Chart 4.2

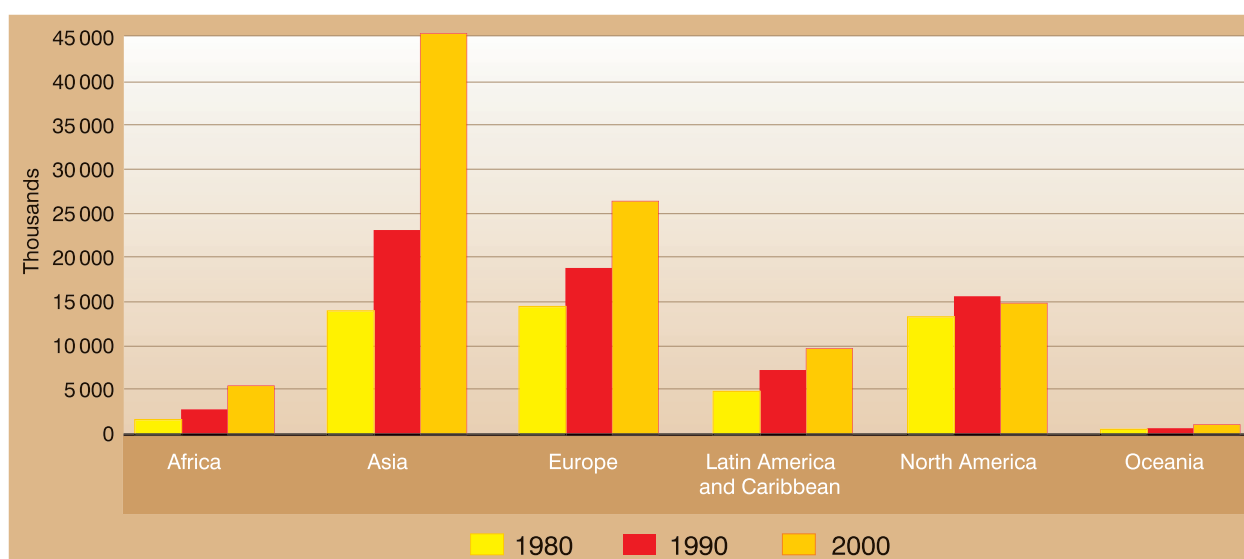**World enrolments in higher education, 1980–2000**

(number of students by region)

Table 4.1
World enrolments in higher education, 1980-2000
(number of students)

Region	2000	1990	1980	Growth 1990-2000 (%)
Africa	5 408 984	2 605 164	1 577 539	108
Asia	45 590 448	23 089 008	13 918 898	97
Europe	26 345 700	18 715 897	14 560 094	41
Latin America and Caribbean	9 707 743	7 118 894	4 819 294	36
North America	14 807 741	15 626 951	13 269 645	-5
Oceania	1 029 037	607 385	408 041	69
Developing countries	**56 475 671**	**30 005 952**	**17 814 199**	**88**
Developed countries	**46 413 982**	**37 757 347**	**30 739 312**	**23**
Total	**102 889 653**	**67 763 299**	**48 553 511**	**52**

Source: World Bank (2000); UNESCO Institute of Statistics (2004).

pursued government-led education (in India nearly all tertiary education is publicly funded), in others (Chile) more than 70 per cent of the total amount spent on higher education comes from private sources (OECD–UNESCO, 2003). This is by no means uncontested – particularly by students who are now expected to pay (higher) fees and by staff who have seen their pay and work conditions casualized.

Besides teaching, research is the second main activity in which universities engage. The capacity to undertake original research is also fundamental to higher education institutions and society in general. Research capacity attracts funding (from the private sector, Governments and foundations) and adds to the reputation of an institution, which it can then translate into increased demand by students and the ability to charge higher fees. Research is validated through publications. Currently, the system of research publishing has one major inconsistency: while university professors and researchers provide their knowledge for free for publication in specialized journals to access research by others they or their universities need to pay a subscription for the journal. According to Oxford Analytica,[4] the six largest publishers publish 40 per cent of all scientific, technical and medical journals, and Reed Elsevier alone leads with 25 per cent of the market. The prices for traditional journals have been rising sharply for several years, increasing the gap between those who can afford access to information and those who cannot.

3. International trade in higher education services

Higher education has value for individuals, institutions, States and other associated service providers (e.g. academic publishers). OECD countries' trade in educational services was around $30 billions in 1999, equivalent to 3 per cent of their total export services (Larsen et al., 2002). The five major exporters of educational services in 2000 (all in millions of dollars) were the United States (10,280), the United Kingdom (3,758), Australia (2155), Canada (796) and New Zealand (199).

International trade in higher education services takes place through the following four modes of supply: (i) cross-border supply: the provision of online degrees to students in another country; (ii) consumption abroad: students move abroad to take a course; (iii) commercial presence: a university setting up a campus in another country; and (iv) presence of natural persons: professors moving between institutions in different countries. It is in the movement of students (mode ii) where most international trade takes place. In 2001–2002, there were over two million students studying abroad (UNESCO, 2004), and chart 4.3 provides an overview of where those students came from and where they went to study. The net exporter regions are North America, Europe and Oceania, while net importer regions are Asia, Africa and South America.

Chart 4.3

Number of foreign students in higher education, by hosting region and region of origin, 2001-1002
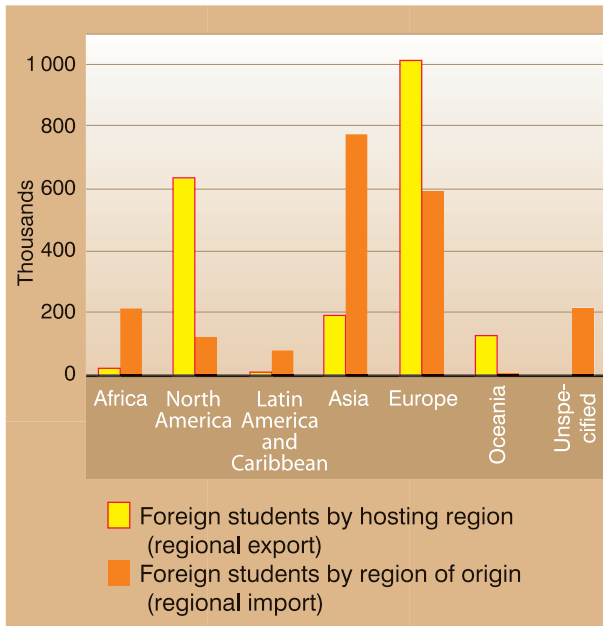
Source: UNESCO (2004).

Data on the exports in the other modes of supply are practically non-existent, but the size of such exports is thought to be limited. For example, Larsen et al. (2002) estimate that in 2000 there were 6,250 foreign distance learning students at Australian universities, corresponding to 6 per cent of all foreign students. In the United Kingdom, the Open University (the largest UK distance education provider) currently has 28,381 overseas distance students,[5] while the country received a total of 225,722 foreign students in 2001–2002 (UNESCO, 2004).

International trade in educational services is not new: selling educational services, studying abroad and establishing educational institutions are conventional features of academic life. What is new is the impetus (at least in some countries) to further liberalize the education sector, and the responses by other actors such as teachers, students and education managers to this opening up of the education market. Higher education services are subject to progressive liberalization under the General Agreement on Trade in Services (GATS). The GATS is flexible in the sense that countries can tailor commitments to specific modes of supply and can even leave entire sectors (i.e. education) without any commitment. Thus, in the contested context described below, it is no surprise to see

multilateral negotiations in education progressing at a slow pace and those Governments driving for open education markets (e.g. the United States) taking advantage of other options such as bilateral agreements.

Proponents of liberalizing the higher education market claim that increased competition will lead to more choice and increased quality through facilitating educational institutions' access to foreign markets by providing individuals with a wider choice of educational services, by increasing opportunities for teachers to work abroad and by increasing competition and thus reducing prices for students. Governments promoting the liberalization of education include those currently leading in the export of educational services and with a strong private education market in the English language, such as the United States and Australia. Under the current round of GATS multilateral negotiations (2000–2005) only four countries (United States, Australia, New Zealand and Japan) have provided a negotiation proposal. Interestingly, the United States, Australia and New Zealand are significant producers of e-learning materials and distance education packages and are the main exporters of educational services. In addition, the export of educational services for Australia, New Zealand and the United States amounted to 11.8 per cent, 4.7 per cent and 3.5 per cent of all services exports.

Opponents of liberalization argue that the opening up of educational services undermines public provision, and can hinder the quality, relevance and equality of access to education. Leaving the provision of education to market forces may provide more flexible outcomes, better adapted to the skills that the market demands at lower prices. However, it is argued that these potential gains will be at the cost of alienating non-commercial education, eroding local cultures and creating a two-tier educational system where only those with sufficient resources will be able to pick and choose from a menu of competing global providers.

In summary, there is a consensus that globalization and liberalization are placing new demands on, and posing new challenges to, equitable access to higher education as well as promoting the emergence of competition in knowledge provision, and creating the need for new quality assurance approaches (see box 4.2). Liberalization also

Box 4.2 **The effects of the internationalization of education**	
CONSENSUS	DEBATE
New demands on higher education Emergence of competitors in knowledge provision Challenges to access and equity Need for new quality assurance approaches *Source:* UNESCO (2001).	Erosion of role of nation State Private HE: Threat/opportunity or norm? Mobility vs. brain drain Unbundling of academic functions

raises questions about Governments' ability to discriminate between national and international providers of education as well as between domestic or foreign students. The changing role of Governments in this regard will have an impact on the autonomy of individual higher education institutions and on the role that Governments play in regulating higher education. Liberalization also reinforces private provision, which exacerbates inequality in low- and middle-income countries, where only a limited percentage of the population can afford private education. Finally, the internationalization of education provides many benefits by further enhancing the mobility of students, such as wider options for qualified students and exposure to different cultures. However, it is also one of the processes that can lead to "brain drain", with competent students leaving their countries of origin and taking their skills with them. There is also the potential for middle-income counties with well-developed higher education institutions to attract overseas students by entering into price competition with established universities in developed countries. The supply and consumption of these services might be an interesting topic for discussion in the context of South–South co-operation.

C. Online higher education

1. Why are developing countries using online higher education?

Given the above debates about access to and provision of higher education, the introduction of online higher education in the current context raises many questions.

Online higher education provides different benefits and opportunities for students, higher education institutions, Governments and educational service providers. By analysing these different factors we have identified six key drivers responsible for the current adoption and promotion of online higher education in developing countries: first, to develop educational capacity; second, to improve quality; third, to increase access to higher education; fourth, to raise revenue; fifth, to enhance the uptake of ICT skills and infrastructure, so as to promote a knowledge economy; and sixth, online higher education is a survival and marketing strategy.

Each stakeholder has different needs and priorities. For example, established universities with high brand recognition are using online education to capitalize on their existing reputation and to expand enrolments. National Governments are funding new virtual universities through public/private partnerships so as to find ways of expanding access to education without a significant rise in the education budget. Not every stakeholder accepts the validity of all six drivers, neither from the economic nor from the educational point of view. For example, it can be argued that investing in online education may not be the best way of increasing either capacity or access and that traditional distance education may well cover this objective more effectively. Nevertheless, there are (as already stated) six main drives of online higher education. They are described below.

1. To develop educational capacity. The Internet makes it possible to reach more people over a wider area with limited access to traditional education in general or to specific higher education institutions. In this sense, online higher education is an extension of the distance learning

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Box 4.3

Virtual University of Pakistan

"The driving force for the Virtual University [was] a nationwide shortage of quality faculty in…higher education. ICT was the only way to overcome these issues."

The Virtual University of Pakistan emerged from a study carried out in 2001 by the Ministry of Information Technology in Pakistan on the feasibility of online university education. The driving force behind the university is the lack of academic faculty, in particular in IT. Quality staff can be found in only a few elite institutions where access is not easy and the cost is beyond the reach of the average citizen of Pakistan. The Virtual University brings together faculty and content onto a single platform that is more accessible and less costly than conventional education. The Virtual University also creates original content, which it makes available to other institutions via an Intranet. It also offers professional development courses in order to disseminate knowledge and expertise and make them more accessible.

Source: UNCTAD e-learning questionnaire survey response, 2004.

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model. For example, the United Kingdom's Open University has long been providing distance education for UK and non-UK students, and it is now incorporating new technologies in the dissemination of education (see annex I). The arrival of the Internet has brought additional access at a distance in the sense that most traditional and well-known universities did not engage in distance education, whereas they may do so now through online delivery. An example of a new institution that has been set up to increase capacity as a motive for investing in e-learning is the University of Pakistan, as explained in box 4.3.

2.   To improve the quality of learning.   There is a strong argument that the use of ICTs can increase the effectiveness and quality of learning by providing increased customization, more flexibility and student choice. In the UNCTAD survey, the Virtual University of Monterrey emphasizes the pedagogical benefits of e-learning: (a) it promotes the development of skills and attitudes, in addition to subject area knowledge; and (b) it offers students the possibility of extending their learning (via links, databases, etc.). However, teachers, students and employers have long contested the quality of online education, and there is a widespread perception that online degrees are of a poorer quality than those based on traditional study. In contrast, as part of a wider lobby promoting the values of ICTs and the Internet, there are groups, within both the educational and the IT community, that assert the value of e-learning in raising educational standards and effectiveness.[6]

3.   To increase access (particularly for marginalized populations).   E-learning can be used to provide innovative solutions to address specific access issues that might make it difficult for potential students to participate in higher education. For example, the University of Palestine has attempted to use an element of online learning to enable students to interact with tutors when they are physically unable to reach the university because of roadblocks and other security measures in Gaza.[7]

4.   To achieve cost-efficiencies.   The possibility of e-learning to expand capacity and access brings with it potential cost-efficiencies (reaching more students for less money) through reducing the cost per unit (or student) and therefore improving an institution's financial position. For many developed country institutions whose budgets have been reduced and which are facing increased domestic competition for funding, the potential to expand their market globally through virtual campuses and other e-learning ventures has been a strong driver. However, the argument that online education provides economies of scale, and thus cost-efficiencies, is contested. Depending on the infrastructure available, the initial start-up costs may be high and, if quality is to be maintained, the cost reduction per additional student numbers will be minimal. Thus, investing in online education solely for the sake of cost-efficiency is a high risk for any provider. In addition to economies of scale, the application of ICTs to education does provide other potential economic

advantages: from the possibility of reselling educational content to third parties to opportunities to increase administrative efficiency, and from better student management systems and access to better information for decision-making to improved communications.

5.   To enhance the uptake of ICT skills and infrastructure, so as to promote a knowledge economy.   Perhaps the key driver for online education at the macro-policy level is that it will enhance ICT skills and infrastructure, and thus serve to reinforce the promotion of a "knowledge economy". Developing an e-learning strategy can complement other national ICT policies. Indeed, there are synergies between different sectors. For example, in the United Kingdom, the Department of Trade and Industry has targeted educational and training services – in particular online education – as a key area for overseas export. The export potential of UK education is underpinned by national investment by the Department for Education and Skills in creating a market for online material through measures such as e-learning credits. One of the potential benefits for Governments in adopting an e-learning strategy is that it can promote the use of ICTs and contribute to the development and use of ICT infrastructure (universities are early adopters of ICTs). Moreover, it can provide a market for related industries, including software, content development, media and other educational services.

6.   Because it's there: survival and marketing strategy.   There is also the perception that e-learning is worth investing in because, to some degree, it represents "the future" and if some institutions have e-learning capacity, then other universities need to invest in order to be able to compete. For example, in response to the question about motivation for e-learning the University of Jzvaskyla, Finland, replied *"necessity...because of European development and Bologna processes in higher education"*.[8] Similarly, Monterrey University makes a selling point of using the most up-to-date technologies available: "(the university) uses the most advanced technological, multimedia, and audiovisual resources for instruction".[9]

Governments' economic and cultural rationale

In addition to the above-mentioned drivers of online higher education, we should add two additional economic and cultural rationales for a Government to promote online higher education: (i) the belief that it can help bridge the digital divide, within and between countries, and (ii) the desire to promote local content for domestic use and for export.

In today's globalized information society, falling behind in access to and use of ICTs (often referred to as the digital divide) can lead to lost economic and development opportunities, and can exacerbate existing inequalities between and within countries. To overcome this digital divide, it is necessary to develop ICT infrastructure and skills as well as an understanding of the appropriate use and application of ICTs relevant to different needs and contexts. However, unless underserved populations (including rural, women, disabled and lower-income students) are consciously and proactively targeted, any national digital divide will increase. Using online education to bridge the digital divide is an attractive proposition, but it will only happen if a coherent inclusive strategy is put in place together with the necessary resources. Partnerships with private enterprises can partially alleviate resources restraints. Currently, international donors, private enterprises and other players have a strong interest in investing in online education.

In the information society, information obviously has essential value. Economies are increasingly dependent on both the information that is available to them and the resources with which to use it. But for this information to be valuable, it has to be relevant to the user, and to the latter's context and purpose. This applies to every user, from the savvy IT student to the basic reader, for every context, from the international market to a small rural community, and for every use and sector from services to agriculture. One of the concerns about the proliferation of online education is the dominance of developed countries in producing and disseminating content and information: most Internet content is in English and originates in developed countries. The effects can already be seen: citizens are unable to access relevant information because it is in a language they do not understand, is irrelevant to their context and incompatible with their existing level of technology and skills. Given that professional content is largely created and shared through universities, online higher education offers an opportunity for national Governments interested in devoting efforts and resources to the creation, promotion

and use of local content. New initiatives such as open content and open source (see section on technology) are putting in place some of the necessary frameworks for the open sharing of information.

2.   The online higher education market

Online higher education is a potentially profitable global market. The OECD[10] predicted in 2001 that there will be 30–80 million online students in the world by 2025. The online higher education market is composed of goods and services that include software applications that enable interaction via the Internet, course content, support services (such as accreditation or education management) and the actual dissemination of education (e.g. the interaction between teacher and student(s)). In addition, online higher education requires products not restricted to the specific online higher education market, such as ICT infrastructure. Table 4.2 presents an overview of the different stakeholders and interests in online

higher education. With online education new stakeholders have entered the higher education market (such as ICT providers – both of infrastructure and of applications), and the bargaining power (that is, the importance and power of a given actor within the market) of existing stakeholders has changed. Potentially, teachers are losing influence to software developers who create structures and systems for teachers to fit their content into. Some students can have increased power because they can now choose among different educational providers, even without leaving home.

Any projection about the size of the online market has to be treated with caution since only a limited number of official statistics include specific indicators on the use of online education and there are not yet internationally comparable indicators. Most indicators related to ICTs and education have been produced for e-learning in general, for primary and secondary education (such as the number of computers per students) or for the corporate market, and this leaves a large information

Table 4.2

Framework of e-learning in higher education:
Main uses and stakeholders

Areas of investment Stakeholders with example	ICT infrastructure	Course delivery and administration	Content and ICT applications	Accreditation services	Students (fees, subsidies)
National Governments E.g.: UK	X		X	X	X
Public university E.g.: Indira Gandhi Open Univ.	X	X	X	X	X
Private university E.g.: Univ. of Monterrey	X	X	X	X	X
ICT Infrastructure/ telecoms sector E.g. Cisco	X				
ICT applications sector E.g: Web CT	X	X	X	X	
Media and publishing E.g.: BBC			X		
University staff Professors and support		X	X	X	X
Students as consumers*				X	X
Educational services providers, e.g.: EdExcel		X	X	X	
International community e.g.: donors / foundations	X	X	X		X

*Students have a dual role as both the consumer of educational services and an area for investment. Clearly, different kinds of students have varying degrees of power and autonomy – not least, a different ability to pay international fees.

Table 4.3
E-learning readiness ranking, 2003

	Score (of 10)	Rank		Score (of 10)	Rank		Score (of 10)	Rank
Sweden	8.42	1	Italy	7.07	21	Romania	4.91	41
Canada	8.4	2	Spain	6.98	22	Venezuela	4.82	42
United States	8.37	3	Japan	6.53	23	Philippines	4.8	43
Finland	8.25	4	Greece	6.52	24	Russian Fed.	4.65	44
South Korea	8.24	5	Malaysia	6.48	25	India	4.56	45
Singapore	8	6	Israel	6.34	26	China	4.52	46
Denmark	7.98	7	Portugal	6.33	27	Saudi Arabia	4.5	47
United Kingdom	7.93	8	Chile	6.13	28	Ukraine	4.38	48
Norway	7.91	9	Czech Republic	6.11	29	Ecuador	4.38	48
Switzerland	7.72	10	Hungary	6.09	30	Turkey	4.33	50
Australia	7.71	11	Mexico	5.96	31	Egypt	3.98	51
Ireland	7.6	12	Argentina	5.86	32	Kazakhstan	3.79	52
Netherlands	7.59	13	Poland	5.73	33	Indonesia	3.67	53
France	7.51	14	Brazil	5.63	34	Azerbaijan	3.67	53
Austria	7.49	15	Slovakia	5.51	35	Sri Lanka	3.66	55
Taiwan P of C	7.47	16	Thailand	5.11	36	Algeria	3.52	56
Germany	7.45	17	Peru	5.1	37	Viet Nam	3.32	57
New Zealand	7.37	18	Colombia	5.05	38	Pakistan	3.22	58
Hong Kong (China)	7.34	19	Bulgaria	5.04	39	Islamic Rep. of Iran	3.06	59
Belgium	7.19	20	South Africa	4.96	40	Nigeria	2.82	60

Source: Economist Intelligence Unit (2003a)

gap in online higher education. Thus, current estimates on the impact of online higher education are based on these other variables or on the impact of the distance education market.

The Economist Intelligence Unit ranking (2003a) grades 60 countries according to their e-learning readiness. In other words, it ranks countries on their ability to produce, use and expand Internet-based learning – both informal and formal, at work and at school, in government and throughout society. This ranking assesses e-learning on the basis of four categories: education (Internet access and use among teachers and students, including equality considerations), industry (use in different sectors), government (its support for e-learning) and society (populations' access to and use of the Internet, including attitudes and overall level of education). Within each category the assessment is based on four factors that make e-learning possible: connectivity – "the quality and extent of Internet infrastructure"; capability – "a country's ability to deliver and consume e-learning, based on literacy rates, and trends in training and education"; content – "the quality and pervasiveness of online learning materials" and culture – "behaviours, beliefs and institutions that support e-learning". Although the ranking examines a broader sector than higher education, it does provide some kind of map of the state of e-learning internationally. Among the leaders are the Nordic countries, the United States and Canada, the United Kingdom, Switzerland, Australia and East Asian tigers (Republic of Korea and Singapore). All these

countries are recognized as having strong educational systems and high levels of ICT penetration, as well as a competitive market. They are then followed by other European countries and other Asian countries. In the middle ranking there are some of the most developed Eastern European countries (Czech Republic, Hungary, Poland and Slovakia), as well as the most developed Latin American nations (Chile, Mexico, Argentina and Brazil). These countries have in general benefited from government policies and from a commitment to exploring different ways of funding ICT investment. Counter-intuitively, given their strong investment in ICTs, South Africa only ranks 40th, and surprisingly India and China, despite their large distance education markets, are towards the bottom of the rankings. Given the limitations of the data presented we can judge that India's high score in the industry category is brought down by low scores in the other categories, while China's score is particularly low in the education category.

According to IDC analysts,[11] the corporate e-learning market was valued at $6.6 billion in 2002, of which $5.2 billion was in the United States. This figure is expected to rise to $23.7 billion in 2006. The expansion of e-learning in corporate organizations benefits from, among other things, having available ICT infrastructure, having resources for training, and in the case of international dissemination of e-learning the opportunity to save on travel costs. Much of the literature agrees that for a wide range of policy reasons, such as equality motivations or ability to raise funds, financial returns in higher education are not as secure as they are in the corporate e-learning market. Thus we can expect the size of the online higher education market to be smaller.

From this analysis, it is clear that the United States is the market leader in the use and export of online higher education. With an estimated 80 per cent share of the corporate e-learning sector, it is expected to have a high market share in the online higher education market. The Sloan Consortium estimates that in the autumn of 2002 over 1.6 million students in the United States took at least one online course, which represents 11 per cent of all US students. Over one third of those students (578,000) took all their courses online. Moreover, Worldwidelearn[12] cites a report by Capella University estimating that "distance learning is expected to increase in the US by 900 percent to include 750,000 students fully online by 2005".

Japan's Ministry of Public Management (2002) puts the value of Japan's e-learning revenues in 2003 at $770 million. According to NetLearning,[13] the Japanese e-learning market is a small proportion of that in the United States, only one thirtieth. In particular, the value of the corporate e-learning market was $290 million in 2003. This is a great difference, even when the fact that Japanese GDP is only half of United States GDP is taken into account.

In Canada there is a strong higher education market both for English-speaking and for French-speaking students, and Canadian education has a good international reputation. Athabasca University, which is regarded as the Canadian Open University, claims to be the first to offer an online MBA and currently hosts over 30,000 students (both online and at a distance).

In Australia all universities are engaged in online education to some extent, and 207 courses are fully online. Australia is a regional leader for higher education, able to attract Asian students looking for education in English close to home. For example, Australia increased the share of international students studying in Australian post-secondary institutions through distance learning and offshore programmes from 18 per cent to 35 per cent between 1997 and 2001 (OECD–CERI 2002).

The United Kingdom has a long tradition of distance education, for example the Open University (see annex I), and is further promoting e-learning and online education in its national and international market. Despite the uncertainty surrounding the UK eUniversity programme, a government-backed initiative to market online courses of UK universities abroad (see annex I), other universities are investing heavily in international online education. For example, the University of Liverpool has signed a 10-year agreement with Sylvan Learning Systems (a large US higher education company) to provide its courses online.

In Eastern Europe, online education is patchy. The good higher education infrastructure is not always matched by extensive access to and use of ICT. Nevertheless the newcomers in the European Union expect that accession will help minimize major obstacles such as expensive ICT hardware and the scarcity of quality content, limited digital literacy and language skills. Know-how for the future includes experience in government pub-

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Box 4.4.

Bolivia wants a national policy on virtual education

"In Bolivia, unfortunately, there is no national policy to tackle the challenges of distance education in public universities, although we know that there have been some sporadic and isolated attempts. On the other hand, private educational institutions are still just consolidating their space in the university system in traditional terms."

The main challenges and hurdles that this form of learning (online) has to confront in Bolivia are "a truly diversified incomprehension of what virtual education means. Bolivian society in general and the education community in particular are very conservative, deeply reticent about changes, about adapting to the new courses and to opportunities for studying, and about being trained and informed. Another big hurdle is at the level of technological infrastructure and access to such infrastructure by the majority of the students."

These circumstances could be avoided "with greater information and promotion of the use and potential of virtual education through, and not primarily by, the Ministry of Education. It will be necessary to combine with State policies that allow countries on the continent to aggressively promote the use of new technologies to the benefit of education."

Garret Aillón, Rector of the Andean University Simon Bolivar, at the inauguration of the first virtual experiences in its Centre for Distance Education.

Source: Translated and adapted from www.elearningamericalatina.com.

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lic–private initiatives in e-learning as well as international collaboration at the higher education level. For example, Hungary has one degree – in law – offered fully through the Internet, by the Pázamány Péter Catholic University,[14] and the Government of Hungary is proposing a searchable database of learning material.[15]

In Latin America and the Caribbean, the Monterrey Virtual University (an offshoot of the offline Monterrey University) has been able to establish itself as a market leader (see section 4). Countries such as Argentina, Chile and Brazil are popular destinations for private e-learning enterprises. There are already a number of online courses from US providers such as the University of Phoenix, UNext and the Monterrey Virtual University, as well as a limited number of traditional universities offering online courses. An example of the latter is the Universidad Virtual de Quilmes in Argentina, which in collaboration with the Universtitat Oberta de Catalunya in Barcelona, has launched a private virtual university. In Peru, the Inter-American Development Bank backed the Instituto Tecnológico Superior, a private business and technology school, to develop virtual professional training programmes.[16] These are not formal higher education courses, but seven-week courses. Their success confirms that with the necessary backing, online education can be successful in attracting students. But countries that are less developed (whether in terms of technologies or higher education in general) are finding it difficult to benefit from e-learning and even less from online education. The example of Bolivia (box 4.4) provides a useful corrective to some of the claims about higher education by illustrating many of the challenges that some countries face regarding online education.

In Asia, online education is growing in the richer and more technically advanced developing countries. For example, in Malaysia there are two institutions playing a leading role in the regional online higher education market: UNITAR (Universiti Tun Abdul Razak), a private virtual university offering 20 academic programmes in the field of business, IT and social sciences to more than 8,000 students at 11 study centres in Malaysia, Cambodia and Thailand, and MUST, the Malaysia University of Science and Technology (see section 3.4), a private research institution set up in collaboration with the Massachusetts Institute of Technology. In contrast, India and China have a long tradition of open and distance education, with experience in the application of technologies to education, such as satellite and radio, but for the moment online higher education is only starting to be developed.

In Africa there is the African Virtual University, originally created by the World Bank and now a donor-led and mixed distance/e-learning initiative. For French-speaking countries there is a specific initiative funded by the Francophonie: the Campus Numérique Francophone, which establishes

ICT-equipped centres to promote the use of online learning in universities in French-speaking West Africa (including in Dakar, Senegal; Cotonou, Benin; and Lomé, Togo). Additionally, there are a multitude of donor-led educational projects, focused on bringing new technologies into African education, such as teacher training in South Africa.

However, the adoption of online education has not been entirely successful. Dramatic failures have already been hitting the headlines: Hawkridge (2003) cites, among others, Fathom ($40 million), a Columbia University initiative; New York Online ($20 million) from New York University; Temple University, which shut down its business without offering a single course; and the UK Open University initiative to establish itself in the United States (£9 million). Additionally, the latest disappointment in online international higher education has been the UK eUniversity (see subsection 5). The reasons for these failures are varied, including problems of accreditation, lack of transparent governance and above all the failure to sell the product and attract enough students. These examples prove that the availability of funding and resources does not guarantee the sustainability of a project.

Trends in the online higher education market

As we have seen, most developing countries are progressively introducing ICT into their education systems subject to the availability of Internet infrastructure and ICT skills. The use of the Internet for higher education is still very limited, but technology in general has long been used to provide education, both through computers in schools and through distance education. The difference between offering one course online and a full degree online is also becoming more relevant for students. Universities that want to be able to reach students at a distance are making every effort to deliver full degrees online or to promote recognition of their individual courses so that the courses can count towards degrees of other universities (thus reinforcing a process of modularization).

Online higher education in many cases evolves from distance education. Open universities (public universities with minimal or non-traditional entry requirements for students, often providing education at a distance), such as in India and the United Kingdom, have long been using technology in a number of ways (radio, TV, videocassettes) to deliver courses at a distance. The transformation from distance to online education is a more natural evolution: instructors are familiar with teaching at a distance, the university already has a structure to develop course materials, and students are used to interacting with teachers and one another across space and time. In marketing terms, online delivery has given more credibility to distance education, which has often been seen as second best to traditional, face-to-face higher education. It seems that Governments are more inclined to provide funding for online projects than to fund distance education. For example, according to Tu and Twu (2002), in Taiwan Province of China the Government was assigning between $3,125 and $9,375 for a traditional university student, while the expenditure for a distance education student is $625.

One of the trends we have seen in higher education is the growth of private providers and an increasingly blurred division between private and public provision. In the United States, with its particular pattern of private higher education, only 4 to 5 per cent of all students are enrolled with for-profit providers. However, 33 per cent of all online students are enrolled with the same provider (Howell et al., 2003). It would seem that private for-profit interests are leading in providing online educational services. Additionally, several public institutions are providing online education through a for-profit institution, such as the failed New York University Online initiative. As in offline education, alliances between for-profit and not-for-profit organizations, and between private and public institutions, provide strategic benefits but also carry governance and sustainability risks, as well as access, equality, quality and ownership implications.

3. The Internet's impact on the international trade in higher education

The opening of trade in educational services is surrounded by uncertainty and current data are insufficient to provide an accurate picture of the value of international trade in online educational services. Nevertheless, some hypotheses about the impact of the Internet on the international trade in higher education can be formulated.

The Internet is promoting international trade in higher education services by facilitating the dissemination of educational content and services through online distribution. Paulsen (2004) indicates that there are 200,000 courses available on the Internet. Whether this is an exaggeration or reality, it gives a flavour of the enormous variety of online educational supply.

Online education is also promoting trade in other modes of supplying higher educational services, such as the movement of students and commercial presence. Online educational providers generally need to work with, or are requested to set up, a local subsidiary to better support students and market their programmes as well as for assessment purposes. Moreover, blended learning is in many cases becoming a preferred mode for engaging in education.

Online education offers an additional mode of entry to educational institutions that want to provide their services in countries with protective educational markets. It should be noted in this regard that developed countries are the major exporters of online higher education services, and developing nations are the net importers of such services. Given that few countries have regulations covering the provision of online services by foreign entities, online education can be a more attractive option for foreign suppliers to offer higher education services in a given country. If national Governments limit the establishment of commercial education providers, the Internet makes it possible to circumvent regulatory barriers (UNCTAD, 2002a).

Online education is becoming an option for students who have difficulties in travelling abroad, and this is particularly relevant for citizens from developing countries. Multiple forces are shaping the direction and numbers of students crossing borders. In general, more restrictive entry regulations for students favour online education or other international and regional markets. The passage of the US Patriot Act has been linked to a decrease of up to 30 per cent in the number of international students enrolled in US colleges and universities (Jaeger and Burnett 2003). This could promote other destinations, such as Australia or the United Kingdom, and online education. But travel restrictions can also jeopardize online education. A large number of online courses still require attendance at short workshops, and visa regulations tend to discriminate against online stu-dents (for example, the number of online courses that an international student can take while studying in the United States so that they count for visa purposes has been drastically reduced).

The application of ICTs to education is allowing for the unbundling of academic functions, which in turn promotes international trade in educational services by fostering specialization and customization of educational services. The unbundling of academic functions occurs when multiple players intervene in the education supply chain: one party may create the course content, another delivers it, a third institution manages the resources, another provides the accreditation, and so on. The drawback to the unbundling of academic functions is that it challenges ownership and control of the educational service, and can consequently jeopardize its quality.

The Internet is also increasing trade in higher education services by facilitating the reuse and reselling of higher education resources to serve the lifelong learning needs of the information society. In a rapidly changing, technology-dependent economy, lifelong learning has become increasingly important for ensuring the necessary and continuous updating of skills (languages, professional skills etc.). As a consequence, the rise of lifelong learning is accelerating the convergence of different educational sectors, including corporate training, higher education and the "other" key sector in international education (language training). As the Internet is already widely used in the corporate training sector, one might expect its use in higher education to further facilitate the reuse and trade of educational services from one sector to another.

4. Models of online higher education

On the basis of an UNCTAD survey of e-learning in higher education carried out in January–March 2004 on a small sample of universities currently engaged in, or planning to invest in, online education, we have identified five different models of how online higher education is being adopted. These models illustrate the different strategies being followed in developing countries for providing online higher education.

Examples from this survey have been used throughout this chapter to analyse the key issues in terms

of the opportunities and challenges for developing country Governments and higher education institutions in pursuing online higher education. Annex I provides a full summary of the survey.

Traditional university going online

University of Monterrey, Mexico; Mauritius University; National University of Lesotho

Established traditional universities are increasingly using e-learning to deliver and support some courses. A number of universities are already providing some courses completely online in addition to the traditional courses they offer.

A well-known case is the Virtual University of the Instituto Tecnológico de Estudios Superiores de Monterrey (ITEMS), one of Latin America's most prestigious private universities. ITEMS has long experience in using ICTs to provide courses and is famous for its television-based distance education. In the late 1990s it started to incorporate the Internet into its teaching and today many of its postgraduate degrees are offered primarily online, with satellite television as a supplement. In 2001 the university had more than 1,200 students studying exclusively online, and around 12,000 students using blended programmes.[17] The policy of the Virtual University is to offer all of its courses online as from 2004.

Open and/or distance university going online

Indira Gandhi Open University, India; UK Open University

Open universities and distance learning universities have long experience in providing distance education using ICTs to support and/or replace face-to-face course provision, including television and radio broadcasting, cassettes and videocassettes. These universities are taking further steps in the use of media technology, using the Internet to provide education.

The Indira Gandhi Open University (IGNOU) caters to the Indian market and is currently serving 10,000 students online out of a total of 334,415 students. It has a history of broadcasting educational content, and has strategic partnerships with Doordashan, India's National Broadcaster and All India Radio. Its major strengths reside in the large domestic market, and an already established support network of regional centres and staff. With a total budget of $14 million, the cost to deliver their online provision is $200,000. The institution buys pre-existing content from other institutions that specialize in particular educational disciplines. For example, IGNOU has entered into collaboration with the EDEXEL foundation in the United Kingdom, whereby some of the pre-existing content of the institution is used for the online IGNOU Bachelor in Information Technology and Advanced Diploma in Information technology.[18] IGNOU also creates its own content.

Independent online courses

LEAD, United Kingdom; UN University; UNCTAD TrainForTrade

This model of online higher education refers to stand-alone online courses or programmes that are part of general educational provision or a capacity development initiative. These courses may be provided by universities or by other non-traditional capacity-building institutions. Particularly in the case of non-universities these courses often do not provide formal accreditation.

UNCTAD's TrainForTrade programme aims at training government officials on key trade issues. Such courses seek to expand the impact of the organization by providing training and developing capacities through the application of ICTs to training. Courses are developed in conjunction with specialized staff of the organization, and are delivered using online techniques. The programme is largely based on donations from Governments.

Consortiums of institutions providing access to online learning

Finnish Virtual University; UK eUniversity; Malaysia University of Science and Technology; Massachusetts Institute of Technology, United States

Online higher education can also be provided through international e-learning partnerships between developed and developing country institutions. This model has the potential for the transfer of know-how and technology.

The Malaysia University of Science and Technology (MUST)[19] was conceived and planned as a

world-class university to cater for the needs of the science and technology sector in Malaysia. The establishment of MUST was announced in 1997 just before the regional economic downturn of 1998. This slump significantly hampered the establishment of the university. However, the idea was resurrected in December 2000 after MUST received financial assistance from the Government in the form of a conditional grant to train highly skilled researchers and scientists for Malaysia. MUST is a research-driven university focused on postgraduate training that aims to attract the best students from the South-East Asian region. It is a private organization that benefits from collaboration with the Massachusetts Institute of Technology (MIT), which provide human resource and curriculum development support. MUST confers its own degrees but benefits in terms of reputation from the association with MIT.

"Start-up" online university

Arab Open University; Virtual University of Pakistan; Virtual University of Small States of the Commowealth.

In some cases completely new online universities are being created. In developing countries, national or regional governments have promoted such universities, which are quite a new phenomenon in these countries.

For example, the Commonwealth of Learning is currently developing the concept of a Virtual University of Small States of the Commonwealth, with a proposed budget of $21 million for the first five years. This project engages small States in Africa, the Caribbean and the Pacific in a collaborative effort to pool resources and knowledge so as to build capacity collectively, as well as to increase access to research and development capacity across national borders, facilitate the exchange of students and teachers, and recognize one another's courses so as to provide greater transferability. The Virtual University of Small States of the Commonwealth does not count as online higher education as such, but it is a first step towards using ICTs in higher education. If successful, it will lay the foundation for a future infrastructure in which to offer online learning.

One of the key issues to examine in any model of online education is governance. Uncertainties and confusion about this issue have too often led to the economic failure of the online education enterprise. Lack of clear governance also impacts on the achievement of the initial educational or developmental aims. Public institutions setting up a private enterprise to deliver online education have found that sooner or later the organizational culture has an impact on the management and control of the newer initiative. Every initiative has to negotiate the different professional values and practices of educators, ICT professionals and educational managers. Governance issues also arise in consortiums where multiple actors join forces and have to negotiate different objectives, collaborate and use joint resources. Open universities face lower cultural barriers to the management of these changes, given the fact that online provision is carried out within the existing structure.

5. Investing in online higher education

As with any public investment in ICTs the most substantial objections to online education arise from the opportunity cost of investing in ICTs and not in other programmes judged to be more vital. Four criteria help determine financial decisions for any investment, including online higher education: profitability, affordability, sustainability and efficiency.

The most common question regarding the **profitability** of online education is whether it is cheaper than traditional education. A starting point for answering this question is to examine the cost structure of e-learning courses. Traditionally, studies scrutinizing the comparative value of different educational models (face-to-face, distance and by extension online education) focused on a cost accountancy exercise. Such studies were primarily concerned with comparing the unitary cost per student or per course. However, as described above, there are a variety of online education models. Therefore, unless applied to a specific case, any cost structure analysis can only serve as guidance. Additionally, this type of analysis is particularly difficult in the field of education, where educational institutions tend to have ill-defined cost centres.

The general economic argument for online education is based on economies of scale. Online education is potentially cheaper than face-to-face education when a large number of students are targeted. Theoretically, the additional cost per student is limited, and therefore a large customer base allows the recovery of the significant investments made

on infrastructure and on product development. For example, the Monterrey Virtual University claims that online courses are cheaper than face-to-face courses (see annex I). However, the economies-of-scale argument has yet to be proved. Some large-scale e-learning programmes have failed despite their aim of reaching more customers (students). For example, the UK eUniversity project, which has cost £62 million (approximately $114 million) (see annex I), aimed at jointly marketing UK online courses abroad but only managed to recruit 900 students (instead of the 5,000 targeted) in its first year of operation. Secondly, the economic rationale for some online educational projects, in particular those on the model of "independent online courses" (as described above), is not based on economies of scale but on providing valuable knowledge in a specific field and on being financed by donors and/or users. For example, UNCTAD's TrainForTrade programme depends on donor funding, the content (and even the software) is developed in-house, and competition is limited to the search for donor monies. The content is highly specialized, and based on the core of the organization's knowledge. While it provides opportunities for the dissemination of knowledge, concerns about self-sustainability, particularly in an increasingly competitive environment, and because of the limits to funding (for example, if the e-learning fashion were to pass), should be addressed. Thirdly, experience shows that currently a large number of projects have still not gone beyond (or have failed before finishing) the pilot phase, and thus it is difficult to judge where full-size projects could be successful. Finally, quality and customization raise doubts about any possible economies of scale for online higher education. Maintaining an acceptable tutor/student ratio cannot be achieved cheaply without alienating teachers, and customization to local culture involves a high degree of content and pedagogical expertise that requires a significant proportion of any budget.

However, there is a broader question regarding the importance of cost: does it really matter if online education is cheaper than traditional education? Interestingly, while in the wider e-learning literature, reducing costs is seen as a major motivating factor for institutions, several of our respondents actually claimed that online courses were more expensive than their offline equivalents, and yet they are prepared to invest in online higher education. Therefore, there are other factors that make the investment in online education worthwhile. From the individual point of view students will be assessing whether their efforts will be remunerated in terms of increased life opportunities, private institutions may look at further utilizing existing infrastructure, increasing loyalty and improving the quality of their services, and educational policy makers will be seeking to increase access and further ICT skills.

Without doubt some institutions in developed countries are enjoying returns on their investment in online education, but the potential for developing countries may be more constrained. For example, online provision increases international competition for students, which in turn has an impact on the ability of institutions in developing countries charging higher prices to non-resident students, given their low brand recognition or their catchment area (students from other low-/middle-income countries in the region). Table 4.4 provides some anecdotal examples regarding tuition fees of online MBAs, and the difference between the cost for a national and an international student.

Affordability, or the question of whether Governments, institutions and students can afford online education is a related issue that can be overlooked in the profitability criteria. Is the Government's educational budget able to afford the provision of online education? Would lower-income students be able to access online higher education? It can be argued that national Governments' investment in online higher education is justified when it allows the participation of students from lower-income levels. But as we saw in the introduction, online education tends to be associated with private provision, particularly in higher education. In some cases, such as MUST, the online project has only gone ahead when the national Government has been able to confirm funding for all national students participating in the programme.

It seems that much of the boom in ICTs in education is being promoted by developed economies and that international funding provides a strong driving force. However, the capacity of international funding to finance higher education is rather limited, in terms of both time and the proportion of overall spending.[20] Thus national Governments are entrusted with the responsibility of taking crucial financing decisions for higher educa-

Table 4.4

Comparative tuition fees for online MBA: Foreign vs. national students

	Tuition fee for international students ($)	Tuition fee for national students ($)	Difference
Developed countries			
Open University (UK)	22 028	17 860	23%
Athabasca University (Canada)	34 338	28 635	20%
Golden Gold University (US)*	37 440	37 440	0%
Developing Countries			
Virtual Monterrey (Mexico)	3 950	3 950	0%
UNITAR (Malaysia)	15 000	15 000	0%

Source: www.open.ac.uk, www.athabascau.ca, www.ggu.edu, www.ruv.itesm.mx, www.unitary.edu.my. Official prices as shown in April 2004.
*International students are not eligible for US grants and pay $90 for visa administration.

tion, by investing themselves and/or encouraging the private sector to invest.

The third major criterion is the economic **sustainability** of any online education programme. Governments of developed countries and international organizations, including the World Bank and the United Nations, have been actively involved in promoting new online higher education initiatives. The question arises as to what will happen at the end of the programme when the specific funds earmarked for online education have been used and the programme is handed to the local institution, and/or when the funding priorities and private investment interest shift to other areas.

ICTs increase specialization, which in turn can bring more **efficiency** to the educational sector by enhancing internal organization, communication and knowledge sharing, and by allowing teachers to specialize in their field of expertise. As described in the next section, the Internet is providing new business models that promote open access to education and research information.

The Internet is also allowing the unbundling of academic functions and thus specialization, as well as promoting the convergence of different educational sectors, by facilitating the reuse of educational content. This can yield new efficiencies and markets, and allow for local customization. However, unbundling can also bring with it possible loss of ownership of educational resources and processes.

Additionally, the efficiency of online education needs to be measured against educational objectives and context. It is clear that what is efficient in a developed economy, with an already established ICT coverage, may not be so efficient for a low-income economy where the number of people with access to the Internet is much smaller.

To summarize: traditionally, the financial analysis of higher education has focused on two areas – firstly, comparing the cost of producing a course or educating a student, and secondly on analysing individual initiatives and their profitability. Both areas of analysis cast doubts on the profitability of online learning, and although there are potential earnings with economies of scale and individual financial success stories, there have already been many failures and there may be more when donors withdraw their funds. Analysis of the three other criteria – affordability, sustainability and efficiency – are also necessary in order to evaluate the economic viability of online higher education, and in particular to enable national Governments to take sound decisions.

6. Technological infrastructure and applications

Technology is not neutral, neither economically nor pedagogically. From an economics perspective, the use (or lack of use) of different technologies has a variable impact on access, cost, efficiency and ownership. What follows is a brief presentation of different online education technologies and their markets, as well as an analysis of

their impact. The description given recognizes infrastructural issues and focuses on the most recent debates on ICT applications for online education.
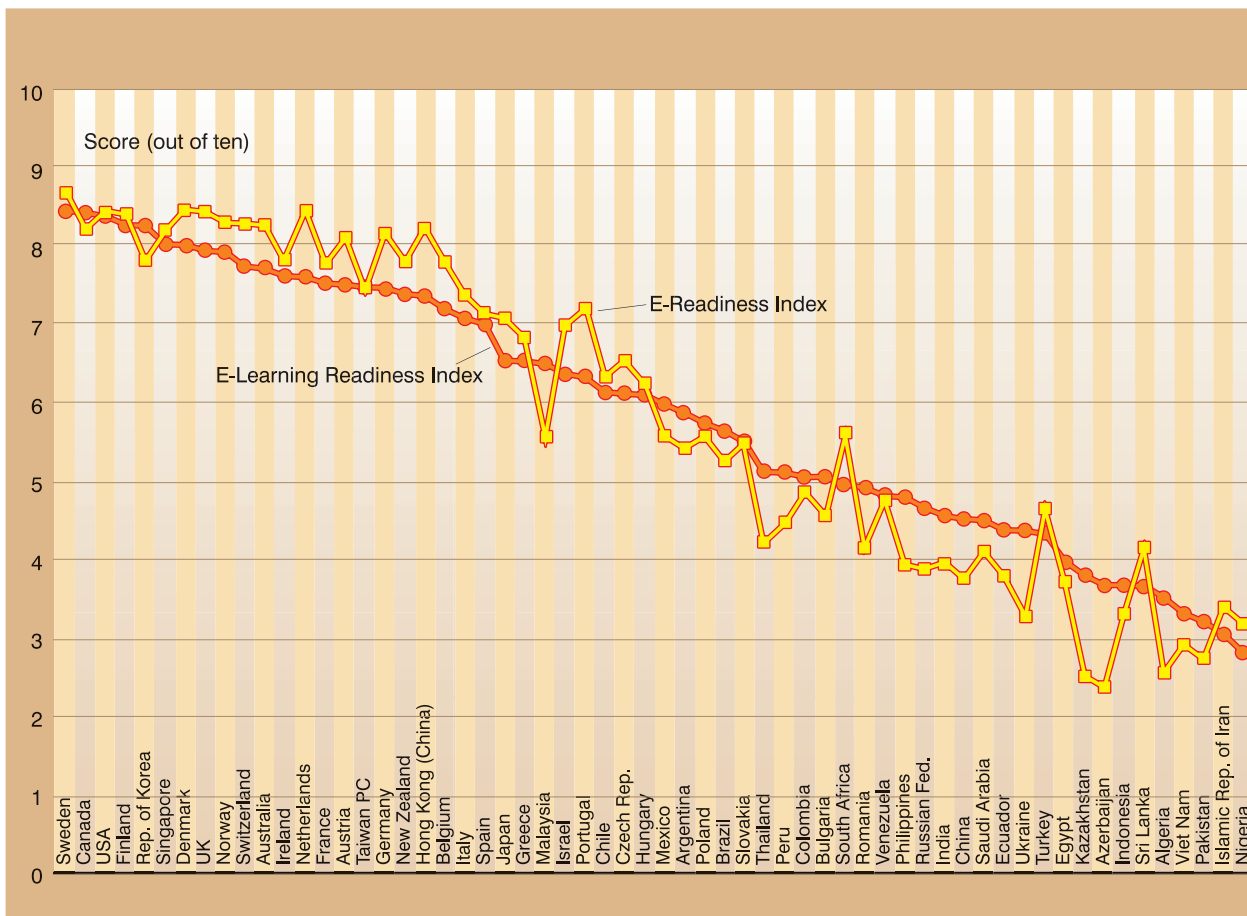
ICT infrastructure

The use and the adoption of online higher education require ICT infrastructure. To maximize the use of ICTs in education computers and software are indispensable, and in the particular case of online learning access to the Internet is also a prerequisite. Reliable and fast connectivity, as well as sufficient bandwidth, are of particular importance in order to make full use of the range of e-learning software and applications – from animated simulations used to enhance learning in engineering or medicine to video conferencing for increased interactivity between students and teachers at a distance. The ability of a region, State or nation to develop e-learning depends on the existence of a strong ICT infrastructure. For example, the Survey of e-Learning Readiness prepared by the Economist Intelligence Unit's (EIU), when compared with the EIU's broader e-Readiness Survey, shows a strong correlation between e-learning readiness and general ICT readiness (see chart 4.4).

However, as the outliers in the EIU's survey illustrates, connectivity is just one part of the picture. The building of knowledge economies and of the related human-resource capacity also requires the availability of non-electronic information and knowledge sources (e.g. libraries, books and journals available to the public), competent educational management, a culture of change and sufficient educational funds. A corollary then is that if online education is to be successful, funding of ICT infrastructure should not be at the expense of other knowledge resources.

Chart 4.4
E-learning readiness and e-readiness

* UNCTAD based on EIU (2003a) and EIU (2003b).

For stakeholders producing or providing education in developing nations the question is how best to maximize the potential of online education and the technological infrastructure available to achieve their objectives. Some providers or Governments believe that the only way forward is to increase connectivity or improve access to new technology. However, others, particularly local developers and providers, defend the use of low or intermediate technology or concentrating access provision in community or distance learning centres, such as the ones used by Indira Gandhi Open University.

ICT applications: Content production, delivery and course management

The Internet has had a major impact on education in terms of both content creation and distribution. Digital technology has facilitated the creation and distribution of content, but the Internet is also allowing wider access to these tools so as to create and share knowledge through global resource exchange and instant/distant content discussion. What follows is an examination of the structures and products that support online content creation, delivery and management.

Designers and teachers use a wide variety of tools to create content, such as word processors, presentation software, audio, video and animation. They also use ICT tools to evaluate students (e.g. assessment tools). Moreover, they use ICT-based communication to enhance teacher–student or student–student interaction. Traditional methods, such as audiocassettes and videocassettes, are and will continue to be widely used in developing countries, for example by the Indira Gandhi University in India, and even in online courses provided by Western institutions (e.g. the UK Open University). To state the obvious: the creation and delivery of content requires course management, and vice versa, and both are reliant on the infrastructure available. For example, distributing content through videoconference will only be possible if the intended audience has access to videoconferencing equipment as well as the knowledge and motivation to use it.

Educational materials for online education are normally referred to as **courseware,** and **learning objects** are the modular units of instruction that can be stored and searched through databases and networks, used and reused, aggregated or re-engineered to suit the purposes of multiple institutions, faculty members or instructional developers (Commonwealth of Learning, 2003). These courseware systems are at the core of online education. Producing such systems is expensive, but their value is maximized if they are designed to be flexible, customizable, interoperable, easy to update and reused. Online education should be more than simply the posting of educational information online. It is the provision via the Internet of fully realized courses, with curriculum, bibliography, pedagogical sequence and so on.

The large majority of online courses are developed in the fields of business management and ICT-related areas. These are popular areas in traditional higher education, but additionally, they have proved good for online learning because they can be standardized and generally require less face-to-face interaction or practice outside the computer. However, other subjects such as education and primary health care studies, which would normally require a strong face-to-face/practical experience, are also popular online courses. Suppliers of online education primarily focus on courses that can be easily produced and reproduced, but also on where there is a large demand. Internet delivery is particularly popular with postgraduate courses, presumably because of their shorter duration and greater independence, as well as their popularity with full-time professionals. A survey of online education and services in Australia (Bell et al., 2002) shows that the courses most repeated are those leading to e-commerce and online education diplomas – that is, the object, as well as the means of study, is the Internet – and that 90 percent of the online courses at universities are at postgraduate level. But as we have seen with the different models of online higher education, other business models are used in distributing online specialized content since this specialization is the core and strength of the providing institution. One such example would be the Master's programme in Leadership for Sustainable Development delivered by LEAD (an international network of individuals and organizations committed to sustainable development, focused on development activities), and accredited by Middlesex University in the United Kingdom. The programme, funded by private donors, supports a limited number of international students to become leaders and maintains a network for sustainable development.

Box 4.5

Examples of projects for open academic and scientific journals

The Public Library of Science was founded by Nobel Prize winner Dr. Harold Varmus and fellow researchers Patrick Brown and Michael Eisen; the Free Online Scholarship (FOS) movement; the creation of the widely read (for profit) BioMed Central to provide "immediate free access to peer-reviewed biomedical research"; the Budapest Open Access Initiative (which has been endorsed by 210 organizations), and similar projects seek to promote new business models for publishing that allow academic and scientific information to be more widely available to the research community.

Other efforts to provide reduced price or free access to researchers in developing countries include the Health InterNetwork, which was introduced at the UN Millennium Summit in the year 2000; a number of projects sponsored by the International Network for the Availability of Scientific Publications; eIFL.Net (Electronic Information for Libraries), a foundation that "strives to lead, negotiate, support and advocate for the wide availability of electronic resources by library users in transition and developing countries"; and a new effort by the Creative Commons to create a licence for free access to copyrighted materials in developing countries.

Source: South Centre (2003).

Open content

The growth of the Internet has led to increased availability of content and, as with public libraries, there is a demand for knowledge to be shared and freely or cheaply accessible. A well-known initiative to make courses publicly available online is Open Courseware. A renowned example is the Massachussetts Institute of Technology (MIT) OpenCourseWare (OCW) initiative, which makes selected MIT courses online available for free (thanks to a $11 million donation from the William and Flora Hewlett Foundation and the Andrew W. Mellon Foundation.[21] The MIT initiative does not result in the full course being available on line or in any user of the OCW gaining an MIT degree. Posting information online is not the same as providing an online course. In some cases, all that is posted on the OCW site is the syllabus and bibliography. Whether because of intellectual property rights restrictions (see next section on legal issues) or management motivations, OCW does not offer access to lectures, explanations and discussions or to the key readings For most users the OCW initiative is not sufficient, particularly for those in developing countries where access to reading material is limited. An additional obstacle is that all information is in English and OCW's plans are that it will continue this way (UNESCO, 2002). Higher education institutions from developing countries are greatly interested in pursuing an open courseware initiative, but not at any price. They have cultural and language concerns as well as the more general infrastructure concern, and they recognize current intellectual property rights barriers. The interest lies in accessing information but also making accessible information from their own countries and communities. Currently, there are informal knowledge-sharing initiatives targeting the needs of developing nations, such as the international Open Knowledge Network consortium, but not at the specific level of higher education.

Professionals from developed and developing countries have suggested (UNESCO, 2002) that open courseware, should:

1. Provide educational resources for college and university faculties to adapt them in accordance with their curricular and pedagogical needs;

2. Include the technology to support open, meaningful access and use of courseware;

3. Include at a minimum the course description, syllabus, calendar and at least one of the following: lecture notes, demonstrations, simulations, illustrations or learning objects.

Research and publication

The Internet is also having a major impact on research and publication. It has led to information being available to more people, new publication opportunities, networking being enhanced through newsgroups and other mechanisms for collaborating across borders. For most scholars in developed countries it is almost unimaginable to engage in research without access to the Internet. The Web has produced a huge increase in "grey literature" – online publication of research outside

the traditional mechanisms of academic publishing. The opening up of knowledge through online databases and journals has had a transforming effect. However, access to a large number of established refereed journals and databases is still controlled through subscription, and the ownership of the intellectual property contained in journals is tightly controlled by publishers.[22]

Secondly, the Internet is challenging and transforming academic research and publishing by establishing new models of peer review and publishing which will influence the balance of power as regards who owns intellectual assets (see box 4.5 for some examples). This shift has the potential to democratize not just access to knowledge but also ownership and control over how that knowledge is used, with clear benefits and advantages for institutions in developing countries.

Additionally, the separation between production and distribution, as in traditional higher education, is blurred. In some cases online content is developed by the provider, the teacher himself/herself or the university (e.g. LEAD develops its own high-quality content), while at other times external content is used, adapted or not (e.g. the Arab Open University adapts materials from the UK Open University).

Content management

Content is provided primarily through Learning Management Systems (LMS). The newer and more advanced version (Learning Content Management Systems) offers additional features that focus on content management and authoring. LMS integrate the management of content – online modules and communication tools – with student registration and administration procedures. They enable an institution to develop electronic learning materials, to offer these courses electronically, and then to use the same system to test and evaluate the students and to generate student databases in which individual results and progress can be charted (Paulsen, 2003).

Universities use commercial and in-house learning management systems to manage their online programmes. The market for LMS is estimated at around $500 million (see table 4.5). There are two major international players: WebCT (United States), a privately held company, created in 1995 with $125 million secured through six rounds of equity financing, which has a 33.5 per cent market share in the United States; and Blackboard (United States), which had a total revenue of $92.5 million in 2003, has 5.3 million active users at more than 1,600 institutions in more than 70 countries and has a 42.5 per cent market share in the United States, covering all educational sectors (Hawkins et al., 2003).

The LMS market is still at an early stage of development. With over 140 commercial offerings worldwide the market is highly competitive with few leaders, mainly based in the United States, but with low market share. For example, Bersin[26] maintains that the market share of the largest player is no more than 7 per cent of the market. A European study found as many as 52 different commercial and 35 self-developed LMS in 113 educational institutions. Moreover, institutions do not seem to be especially loyal to a particular brand, switching between different packages or using several systems in one university. For example, a survey of Australian universities found that out of 40 respondents, 29 used WebCT, 20 had their own in-house system and 17 were using Blackboard.

The LMS market will be expanding (with new and updated products, and a diversified language offer) and is expected to undergo some consolidation through the merger of providers. The provision of more languages and features, together with increased standardization or open source systems development, will reduce institutions' incentive to develop their own software. However, economic rationale does not always play a part in opting for the in-house development of a system; rather, decisions are often driven by the bargaining power and interests of ICT departments. Evidence from a

Table 4.5

Learning management systems market
(millions of dollars)

ESTIMATIONS BY:	2001	2003	2004	2006
IDC	$ 800			$3'600
Simba Information	$ 200			
Lifelong Learning Report			$ 529	
Bersin & Associates		$ 350		

Source: hr. com (2004)[23], HighBeam Research (2004)[24], Bersin (2004)[25]

study of LMS systems in European institutions (Paulsen, 2003) suggests that IT sections of universities and other institutions attach great importance to developing their own platform and not buying programmes developed by others. For example, in the United States only 7.2 per cent of institutions have developed their own LMS (Hawkins et al., 2003), whereas in Europe 35 out of 113 (32 per cent) have developed their own system. Universities have developed and/or acquired their own LMS, benefiting from available free and open source systems or from partnerships with other institutions (e.g. the UK Open University and the Arab Open University).

Open applications

ICTs have allowed the production and distribution of content in a variety of electronic formats incorporating different media. The ability to use content on different platforms is an asset, particularly in education, where the potential for content exchange is unlimited. Currently, there are two complementary approaches to ensure interoperability and transferability: free and open source software, and open standards. Although their approaches differ, international initiatives such as SCORM and the OKI (explained below) are playing a central role in promoting openness and reusability of content.

Free and open-source software (FOSS) is software that has made its source code public, and allows users to modify the programme and thus customize and adapt it to particular needs.[27]

FOSS, already widely used for web server technology, has a more limited presence in desktop software. However, in the field of education, it has the potential to become widely used in management systems and on desktops. Firstly, universities are at the centre of open software development that is, there is a strong connection between users and developers, which facilitates the continuous updating and support that ICT software requires. The list of current open source course management software (see annex II) shows how most software is developed in or with the support of a university. Secondly, the positive externalities of education provide a strong incentive for sharing and maximizing the use of existing technology and content. Thirdly, FOSS, at least until there is a full commitment to interoperability, can provide the necessary communication links between

different IT platforms and tools. Finally, the education software sector is still in its infancy and neither the commercial nor the FOSS market has a monopoly; consequently, early developers have the opportunity to find a niche.

One FOSS example[28] is the Open Knowledge Initiative (OKI) course-management system. This developed from collaboration among top US and UK universities. Led in the United States by MIT, and supported by a philanthropic donation, the OKI is a scalable and sustainable reference platform designed for Internet-enabled education, which specifically addresses the needs of higher education. As its web page notes, where possible it uses open standards and its code is available to everybody, including commercial vendors.

A study (Harris and Yanosky, 2004) of 117 institutions involved in e-learning (87 in the United States and 30 elsewhere) showed that when institutions bought new e-learning products, in 16 per cent of cases they would choose free and open source, while 80 per cent would choose commercial products, and only 4 per cent would choose in-house development.

The second approach to ensure interoperability is the commitment to and use of **open standards** both by commercial and by open-source packages. Open standards are transparent descriptions of data and behaviour that form the basis of interoperability. They are crucial for maximizing the use and reuse of different media and content, and they guarantee interoperability, which open source software per se does not. However, in practice, developers and providers show different levels of commitment to open standards.[29] Because they wish to protect their product or to reduce software development time, standardization is not always regarded as suitable.

An example of an open standard that has achieved some success in corporate learning programmes in the United States is the Sharable Courseware Object Reference Model (SCORM) initiative. This initiative, which began in 1997, is part of a wider US government programme for distributing learning. Its aim is to foster the creation of reusable learning content. The initiative has identified critical technical interface points around which standards for web-based learning technologies might be developed. The first ver-

sion was released on 31 January, 2000, and since then 64 LMS have adopted SCORM standards (www.adlnet.org).

It should be noted that the ability to use content on different platforms and to connect different systems provides further efficiencies. In terms of ICT efficiency the optimum choice to promote interoperability is a combination of open source and open systems. Some institutions have already paid a high price in entering into contracts with fixed technology systems, and those that have to take decisions in the future will benefit from analysing the potential costs of all the options available.

7. The legal framework

As we have seen, access to, and cost, ownership and efficiency of, online education are conditioned by technology, but also by the broader policy context and particularly the existing legal framework and the general level of ICT skills. The legal framework affecting online higher education extends from specific regulations in the field of education (recognition of titles, accreditation of educational institutions, curriculum design, teachers' qualifications etc.) to broader legal issues, including intellectual property rights, commercial law, security and authentication, electronic payment systems, consumer protection, applicable law, and fiscal and customs regulations. Both sets of regulations shape the ability to buy, sell, develop and use online higher education. For example, in order to sell a degree online an institution needs to be accredited and, the degree needs to be recognized; students want to be protected against provision default and unauthorized use of their personal data, course developers want to control the use of their work and Governments want to control the quality of online educational programmes.

Of the various legal issues[30] affecting online higher education, this chapter highlights two of particular relevance for developing countries: accreditation and recognition, and intellectual property rights (IPRs). These issues are of special interest to developing countries since these are the countries that suffer most from lack of access to, and recognition of, their knowledge resources, and are the net importers of online higher education.

Accreditation and recognition

Accreditation is the currency of higher education. While learning for its own sake has cultural value and in some circumstances can be viewed as a leisure activity, in economic terms it is accredited and certified qualifications that count. Through appropriate quality assurance approaches and accreditation systems, Governments and accredited institutions ensure and promote quality in higher education, support the transferability of degrees across states, regions or nations and guarantee the authenticity of a degree.

National quality assurance and accreditation systems vary from one country to another and in many developing countries are non-existent. The lack of trust in a national accreditation system seriously undermines its educational credibility both nationally and internationally. Each government has its own policies to provide accreditation; for example, in the United States accreditation is provided through independent not-for-profit organizations, and the only role of the US Department of Education is to oversee such accreditation institutions, not the actual educational institutions themselves. This high degree of institutional autonomy contrasts with European education systems (such as those in Germany and France), where autonomy to borrow money, to invest in new products and, therefore, to market degrees online and internationally is more limited.

As regards accreditation, online higher education is an issue in the key areas of quality, transferability, authenticity and branding. The growth of harder-to-regulate online higher education, as well as the increase in the number of higher education students, and the internationalization and privatization of education, provides challenges for national accreditation systems. Online education increases the number of programmes and individual modules, as well as the number of institutions offering educational services. This creates problems of evaluation, inspection and examination, and educational services providers may find it easier to circumvent local regulation by going online.

Quality assurance and accreditation systems tend to be weak in most developing countries, particularly in Africa and the Arab regions. However, in the light of increasing demand for and supply of higher education, accreditation systems are being revised in those regions. Countries such as Malay-

sia and South Africa are already working on updating their quality assurance and accreditation systems. For example, South Africa established a Higher Education Quality Committee in May 2001 to tackle the large number of private institutions offering higher education programmes illegally (OECD–CERI 2003).

Despite the current initiatives to update national accreditation systems, they tend to ignore the specific features of online education, leaving this mode of delivery in a limbo (at best). But there are some innovative examples: in India the National Assessment and Accreditation Council has now been asked to prepare for the responsibility of accrediting the international educational offerings in all forms, including electronically (OECD–CERI 2003).

The existence of national systems of accreditation means that institutions recognized in one country are not automatically recognized in another. For example, the UK Open University has failed to gain accreditation in the United States. Online higher education circumvents this obstacle: it allows institutions recognized in one country to provide online education in another country without needing a specific accreditation since the qualification on offer will be accredited in the exporting country. In online education what counts is the ability for a nation and/or institution to develop a reputable and desirable brand for its online courses.

However, in some cases accreditation systems aiming to ensure quality make requirements that can hamper the flexibility of online higher education internationally. Examples include making it compulsory to have a national licence to work (for example, as a lawyer) or for students to engage in some element of face-to-face contact so as to minimize the risk of cheating, or even requiring the same curriculum as the home-campus version. All these are part of the Malaysian quality assurance framework.

Renowned university brands sell well offline and provide a valuable asset for their online endeavours. Additionally, other universities have successfully built their brand and recognition solely online (i.e. the University of Phoenix). Students look for recognition, either through brand value or accreditation of their studies by developed country institutions or developing country

regional leaders (i.e. the African Virtual University). Developing countries in particular suffer from poor recognition of their degrees, and the arrival of online education is a further threat. Before the advent of the Internet, poor institutions sought partnerships with counterparts in richer countries that could provide them with the established brand recognition. With online courses, students who have the requisite resources can increasingly study in prestigious universities while staying at home and opt for the more internationally valuable foreign degrees.

In summary, it is likely that in online higher education both branding and accreditation will play an important role in shaping the market. But they must not be confused: branding provides the marketing value, while accreditation makes a course valid.

Additionally, there is the question of the validity of an online course if the institution cannot be sure who actually took an online examination. For example, the Arab Open University insists on a physical written examination as a part of its assessment process so as to compare to and validate online assessment.[31] In consequence, ensuring authenticity for e-learning courses may imply added costs, such as the establishment of centres for examination purposes, which may have an impact on financial sustainability. The UK Open University supports this extra cost by charging a fee to students who want to be examined outside centres already established. The submission of written assignments, as in offline education, also creates concerns over the authenticity of students' work. The Internet has amplified the options for plagiarism or even "pay & get your essay" services. For example, www.ivyessays.com offers essay services from $12.99 per page, or for $14.95 one can have a monthly subscription to www.digitaltermpapers.com and have access to its database of essays. Institutions are exploring a combination of physical presence, technical tools and pedagogical measures to overcome authenticity issues.

Currently, there is no single international accreditation body for either online or offline higher education. Education has traditionally been in the national domain, and thus most regulations are at the national level. In order to be meaningful, global education requires transparent and recognizable standards of accreditation, but the debated

search for an international accreditation system is in itself being questioned. Organizations from developed countries reject the idea of developing an international accreditation system on quality grounds. And organizations in developing countries dislike supranational regulations that could limit a country's cultural identity and might fail to take into account the different levels of development.

International measures to assure students of the value and transferability of their studies have developed primarily in a second area – one that is complementary to accreditation, namely recognition. Most of the initiatives to recognize titles granted by educational institutions in other countries are at a regional level. The principal ones are the regional conventions (Africa, Arab region, Asia and Pacific, Europe, Latin America and the Caribbean, and the Mediterranean region) on the recognition of qualifications. While the European region is renowned for its efforts (as part of its deeper integration) to recognize different national qualifications at a regional level (known as the European Bologna process), other regions have not been so successful in achieving such results (UNESCO, 2001).

In certain professions, such as teaching, medicine, law and architecture, professional certification is essential in order to be able to work. This certification is greatly restricted on a geographical basis. For example, obtaining a degree in medicine in Spain does not allow the holder of that degree to work in the United States. Moreover, professional certifications usually have a strong face-to-face and practice component: for example, no one would want to be operated on by a surgeon with a purely online degree. Thus, it is not surprising for courses leading to the professional qualifications just mentioned to have a limited presence in the online sector.

In specific cases, online courses can lead to industry-standard certifications, which are very valuable in themselves. The Cisco Networking Academy is a successful example. Launched in 1997, it has provided basic Internet technology skills to nearly 300,000 students through over 10,000 academies, preparing them for industry-wide certificates. The reasons for its success are clear: it has access to a large amount of funding, has a standardized curriculum, and benefits from an excellent network infrastructure, as well as strong partner-ships and marketing. This model has enabled the Academy to operate in 33 of the world's least developed countries.

Intellectual property rights

IPRs play a role in determining the ability to access, produce, copy and distribute content and specific expressions of knowledge. Having access to knowledge does not prevent others from benefiting from such knowledge. However, economic policy has long supported the need to grant temporary property rights to innovators so as to enable a return on their investments and thus encourage them to continue innovating, thereby contributing to a society in general. On the other hand, IPRs also act as a deterrent to innovation by limiting free access to knowledge and information. The effects are notably greater for developing countries that lack resources to pay for access, and that are net importers of such goods and services.

Since education is a (contested) public good,[32] and is strongly based on knowledge, the application of IPRs to education is of particular importance. The arrival of the Internet has aggravated the conflict in several ways. The Internet is promoting more knowledge exchange around the world – from developed to developing countries, and vice versa. Since online education services derive from diverse sources (music, software, content, design, media, etc.) they are also restricted by varied protecting rights, which are now enforced by both technical and legal methods. Moreover, free public access to knowledge (e.g. through libraries) is not guaranteed through the Internet.

There are a few initiatives taking place in different spheres to ensure that the public enjoys further access to knowledge. Leading examples are the previously mentioned open source software, content and standards initiatives. As these initiatives become more widely known to both the public and content and software creators they should be able to expect stronger support. The more important policy question is whether policy makers and institutional managers in local, national and international arenas will be able to recognize and promote the benefits of open knowledge sharing and to establish adequate legal frameworks and practices for ensuring this sharing, in particular for developing countries.

D. Conclusion: The Internet's impact on, and implications for, higher education

In a world where access to, and use and creation of, knowledge is central to social and economic development, higher education is in increasing demand. Online higher education is in some cases providing further educational options for students, promoting the sharing of information and knowledge worldwide, reinforcing ICT use and access, and supplementing traditional modes of supply of education.

Data measuring the size and shape of the online higher education market in developing countries are limited. Nevertheless, estimates speak of a small volume of online-only higher education courses in developing countries, with higher concentrations in more developed nations and among elite populations, particularly catering for the "earner-learner" – that is, professional, postgraduate – student population, and in high-demand subjects. For the time being online higher education is a niche market, particularly in developing countries.

Current initiatives in the use of ICTs in education in developing countries are concentrated on the progressive use of ICTs in education (CD ROMs, e-mail communications, basic acquisition of ICT skills etc.) rather than on purely online higher education. Face-to-face delivery and traditional distance education continue to provide the bulk of education. The opportunities to develop online higher education include an expanding higher education population, a strong interest in developing ICT-based skills and education, and an interest in financing ICTs. Further opportunities are also available, in some cases because of the existing educational infrastructure, and the prospects and resources offered by other forerunners. On the other hand, institutions face a series of constraints in developing online higher education. As the UNCTAD survey has shown, these include the lack of access to ICT infrastructure, the high cost of ICTs, the lack of ICT skills, international competition and student preference for face-to-face teaching.

The lack of **access** to ICT infrastructure and applications is often highlighted as being of particular importance to developing countries. While this is true, there are some examples of innovative and appropriate methods of using technology. Similarly, there are open approaches (open software, open standards, open content and diversity) that can promote wider access to technology and content. Moreover, ICT capacity will continue to increase in developing countries, making the expansion of online education possible.

The **economic drivers** to invest in higher education consist of more than simply the desire to directly reduce the costs of education. The assumption that online education is cheaper than traditional education is questionable as cost-savings examples have not been properly verified. In each case, a review of the cost of online higher education in terms of affordability, profitability, efficiency and sustainability is necessary for understanding and evaluating the rationale and implications of investing in online higher education.

The Internet is in some cases shifting the cost of online higher education from the Government onto other providers (public–private partnerships), from the institution to the students (in the form of increased fees), from national to international providers (through sponsorships and partnership agreements) and from national to international students (by charging differential fees to non-domestic students). Thus, online higher education is being financed by a number of stakeholders with different interests, and although there is a momentum to invest in ICTs for online education, private investors are not always governed by educational priorities nor by the imperative to bridge the digital divide or to promote local content.

ICTs increase specialization, which in turn can bring more **efficiency** to the educational sector by enhancing internal organization, communication and knowledge sharing, and by allowing teachers to specialize in their field of expertise. Additionally, the Internet is encouraging new thinking about the validity of current business models for the provision of education and access to research. The Internet has impacted on thinking about the purpose and profitability of academic research and publishing, as well as having forced consideration of the value of open systems in technology, thus prompting similar debates in higher education about the use of open content and open technology.

The Internet has expanded the diffusion of knowledge but it has also altered the terms of **ownership of knowledge**, with pulls in different directions. On the one hand, it has increased access to knowledge by making accessible research, publications and networking opportunities. On the other hand, the desire to control intellectual property leads to increased privatization of knowledge. Further clarification regarding the application of regulatory issues to online education, including intellectual property rights, is necessary in order to allow transparency and confidence. Proven initiatives such as FOSS, open standards or open content benefit common ownership and use of information.

The Internet has further internationalized (the trade in) education, and is increasing access to international higher education services, both online and offline. These effects contrast with the fact that developing countries tend to be at a disadvantage in the international education arena, where institutions in developed countries attract most international students, and degrees from developing countries are far from being fully recognized in developed nations. The Internet is promoting competition for international students and thus it increases pressure on developing countries' institutions. Additionally, online higher education requires further strengthening of quality assurance and recognition processes.

Recommendations

On the basis of the above analysis a number of suggestions are provided below for Governments and educational institutions in developing countries.

Despite the growing competition that developing country institutions face in the provision of higher education from developed countries, they still have a broad range of strategies that they can use to attract students. Firstly, they can differentiate their courses through local content/language. Secondly, they can gain recognition of their institutions and courses by attaining international accreditation either on their own terms or through association with a developed country or regional institution. Thirdly, they can maximize the advantages of geographical presence in a market. Finally, they can pursue a strategy of developing regional leadership, although this is clearly not a strategy that all institutions can succeed in pursuing.

One important role of Governments is to ensure that the current widespread enthusiasm for online education[33] does not overshadow the wider objectives that they set for initiatives such as reaching students who are under-represented (owing to disability or geography, or for some other reason), providing local knowledge, and reducing the digital divide. Governments have the opportunity to pursue policies that redress existing online higher education deficiencies and that maximize educational and developmental outcomes. Some of the options available to Governments to ensure that online higher education has a positive impact on reducing the digital and educational gap are set out below.

- Creating awareness and encouraging collaboration and dialogue between educational professionals, the IT sector and other stakeholders (such as students). There are multiple stakeholders with different interests in online higher education. A better understanding of each other's interests, aims and strengths facilitates the promotion, design and implementation of online educational initiatives.

- Fostering a culture of learning, through investing in traditional resources (books, teachers) and technologies. Funding online infrastructure and applications should not be at the expense of traditional knowledge resources, and local content and existing expertise are a valuable resource to be supported and promoted.

- Promoting coherence between educational and ICT strategies. The use of the Internet in education has the potential to, among other things, provide wider access to knowledge, promote ICT skills and enhance educational networks as well as international presence. However, ICTs are only tools to achieve educational objectives. Relevant ministries within Governments need to consider broader educational strategies when thinking about e-learning so that e-learning strategies meet current and future national educational priorities. There should also be coherence with the general e-strategy, so that measures to solve common concerns regarding infrastructure, skills and the use of open systems are consistently reflected in both sets of strategies.

- Supporting the use of open technology and open content in higher education. The use of free and open source software encourages the deepening of ICT skills and allows for local customization, and as with open standards, it promotes the interoperability of different e-learning tools. Open content is a valuable option for developing countries, both to access foreign content and to further disseminate local content. Governments play a role in promoting open initiatives, in particular in the field of higher education, by promoting their use in universities.

- Providing incentives for investing in e-learning and online higher education so that educational goals are maximized – for example, regulating the provision of online higher education, and promoting long-term sustainable partnerships between different actors (e.g. a software company and a university) that set minimum quality and reach requirements. The aim should be to enable an educational environment that provides equitable access to education and that is aware of the limits of a competitive environment.

- Developing transparent quality assurance, accreditation and recognition measures both nationally and globally, through consultation with key stakeholders, ongoing evaluation and consensus, so as to ensure that they cover the specific nature of online higher education and that they allow the achievement of particular educational goals.

- Monitoring and measuring the economic, educational and social benefits and/or costs of e-learning in general, and online higher education in particular, as well as carrying independent and rigorous research into the uses of online learning, so as to be able to benchmark and evaluate the efficiency of e-learning initiatives and return on investment.

In the light of the assessment made in this chapter of the experience acquired so far, it is not possible to give a categorical answer to the question of whether online higher education is a sound proposition for developing countries. Governments' best option is to analyse the benefits of online higher education from the overall development perspective, including national educational objectives, and the competitiveness and quality of the online education on offer, with a full analysis of the financial restraints and the opportunities offered by partnerships and open source-software/content approaches.

In conclusion, online higher education can fulfil some of the promises made on its behalf to the extent that the educational and policy environment enables the expansion of higher education to previously excluded students, encourages relevant and appropriate learning content and processes, promotes innovation and investment in education, and recognizes students' needs and efforts.

Annex I

MODELS OF ONLINE HIGHER EDUCATION

UNCTAD conducted an in-depth survey on e-learning in selected higher education institutions. The findings of the survey, which have been complemented with parallel research, are summarized in five broad models as follows:

Model 1: Traditional university going online

Model 2: Open university going online

Model 3: Independent online courses (from non-traditional capacity-building institutions)

Model 4: Consortiums of institutions providing access to online learning

Model 5: Start up institutions using e-learning

MODEL 1: Traditional university going online			
Examples:	Monterrey Virtual University www.ruv.itesm.mx/	Mauritius University www.uom.ac.mu	National University of Lesotho www.nul.ls
Budget/ finance:	$700 million per annum	$2.5 million	No data available
Online cost:	$30 million Cheaper than offline	More expensive than offline (for business and IT courses)	Not providing online courses at the moment
Cost structure (e-learning)	Regular budget. Primarily funded through students' fees.	Regular budget: student fees ($2 million) and government funding ($0.5 million)	Not applicable
Reach:	12,190 online students (5,586 Master & 6,604 undergraduate) Total number students: 93,797 National & international students. 16 programmes and 216 courses	National	National
Content:	Creates own content	Creates own content, and buys pre-existing content from India, South Africa, UK and USA.	Not applicable
Accreditation:	Yes, Monterrey University	Own	Own
IT strength:	Robust, IT University, mixed tools	Creates its own content	Commitment to investing in ICT and exploring the possibilities of e-learning
Bargaining power:	University of Monterrey (institution)	Negligible	Poor
Partnerships:	With graduate programmes, continuous education providers, social programmes.	No formal partnerships but receives donations of free software from Microsoft; buys content from India, South Africa, UK and USA	None as yet, although the university receives funding from private sponsors and charities
Demand:	Spanish-speaking students in Latin America and United States.	National	National
Strengths/ Opportunities:	Name recognition, accreditation, regional leadership, cost-effective	Creates own content, commitment to using ICTs, expanding provision.	Commitment to expanding access to education and to innovation
Weaknesses/threats:	Tutoring. Students' preference for face-to-face learning.	Transition to new culture, lack of access to ICTs, lack of funding	Lack of financial resources, lack of qualified staff, absence of national ICT policy framework to support e-learning. Weak higher education
Trading opportunities:	International	Plans to deliver one IT course internationally through a partner institution	None

MODEL 2: Open and/or distance university going online

Examples:	Indira Gandhi Open University www.ignou.ac.in	UK Open University www.open.ac.uk
Budget/ finance:	$14 million	$400 million
Online cost:	$0.2 million	30 million spent on e-learning
Cost structure (e-learning):	Student fees, government funding. All funding has conditions attached except student fees. Low fees.	Combination of student fees (international and home students) and government funding. Also attracts significant research funding for e-learning and has partnerships with a number of organizations, including MIT and Research Machines (the UK's leading educational technology company)
Reach:	334,415 students (10,000 online students, 60% of them are employed) International part-time students	160,000 students and their tutors are online (3/4 of total number of students)
Content:	Own and pre-existing content. Wide variety of formats and sources. Publishing and design are the main cost driver.	Creates its own online content as well as partnships in creating broadcast material with the BBC. Online content, largely lecturer- and department-driven
Accreditation:	Own degrees and diplomas recognized nationally. Possible credit transfer to & from other universities.	Own degrees, which it also offers internationally.
IT strength:	Broadcasting (TV and radio). Progressively introducing online courses	Broadcasting – partnership with BBC, publishing. Centre for innovation and R&D in e-learning within the university
Bargaining power:	Management and academic community. Government (representation on management board)	Size, expertise, tradition, resources
Partnerships:	Doordashan India's National Broadcaster; All India Radio; Government of India, Department of Electronics; EdExcel UK	National Broadcaster (BBC). Today it has partnerships and/or students in 31 countries.
Demand:	High national demand. Over 11 million students	National and international
Strengths/ Opportunities:	Large domestic market and demand. Distribution and support network. Increasing national economic investment in education	General strong institutional position. Institute of Educational Technology engages on research on the use of e-learning.
Weaknesses/threats:	Availability of suitable software and hardware, low penetration of the Internet and low demand for online programmes. High cost of ICT. Poor primary education	Increased global competition; Residual suspicion of the quality of "distance education"; inability to operate in the USA
Trading opportunities:	Delivery of services through other institutions in India	Began offering degree courses overseas in 1982. 28,381 overseas students and 42,710 students in collaborative teaching programmes

Sources: Open University. See e-learning and the Open University (2003). Available at http://www.open.ac.uk/elearning/index.shtml, as well as the factsheet "The Open University worldwide", available at http://www.3.open.ac.uk/media/factsheets/Information%20about%20The%20Open%20University/The%20Open%20University%20 Worldwide.pdf

MODEL 3: Independent online courses (from non-traditional capacity-building institutions)

Examples:	LEAD www.lead.org	United Nations University www.unu.edu
Budget/ finance:	$5 million	$30 million / year
Online cost:	Not applicable	$50,000 per course. More expensive than offline, except ICT courses
Cost structure:	Non-regular	Regular and non-regular, government, endowments, fees
Reach:	Limited. 100 national and international students have graduated.	National & international, part-time students
Content:	Own high quality	Own research
Accreditation:	Master in Professional Studies, accredited by Middlesex University, UK	None; occasionally a course may count for an external degree
IT strength:	Limited, progressive	Progressive
Bargaining power:	IT industry, publishers, institution management	Primarily, IT industry and infrastructure providers (pricing policies present real obstacles). To a lesser extent, institutional management and publishers.
Partnerships:	Higher education institutions, learning network, foundations, NGOs	UN, higher education institutions, businesses
Demand:	Part-time environment specialist students	Support for traditional capacity development activities.
Strengths/ Opportunities:	Quality, specialized	Well-known brand name. Specialist expertise
Weaknesses/ threats:	Funding, costs, human resources	Staff resistance, lack of expertise and student support
Trading opportunities:	Provision of services	None. Some envisaged in the future through partner.
Quality measured:	Questionnaire, external evaluator, students' feedback	

Sources: LEAD. See LEAD International Masters Program. Available at www.lead.org

MODEL 4: Consortia of institutions providing access to online learning		
Examples:	Finnish Virtual University (University of Jyväskylä) www.virtuaaliyliopisto.fi	UK eUniversity www.ukeu.com
Budget/ finance:	$102 million	$114 million from UK government funding, plus student fees.
Online cost:	Finnish Virtual University: $480,000 Online costs as much as offline	Variable from institution to institution $37 million invested in the custom built learning platform from Sun Microsystems
Cost structure (e-learning):	The government finances almost the totality (95%)	Joint venture between UK universities and the private sector with government funding plus student fees
Reach:	National and international	International
Content:	Develops own content, and buys electronic publications and journals, mostly from US/ UK publishers.	Provided by partner universities
Accreditation:	Yes, own university	Yes, through each of the individual universities involved
IT strength:	Mixed tools. National prominent e-readiness	Integrated, web-based learning management software
Bargaining power:	Management and teachers, followed by publishers	UK university partners, UK government ministries (education and department for trade and industry)
Partnerships:	Finnish Virtual University is associated with Finnish universities to provide 450 courses.	Technology from Sun Microsystems 20 UK universities providing course content (including University of Cambridge, University of Manchester, University of Leeds) International partners from 16 countries (including Beijing Foreign Studies University) International corporate and IT partners
Demand:	5000 Finnish Students	Low
Strengths/ Opportunities:	Individual courses, accreditation. Network of 16 disciplines. Government's interest in investing in higher education.	UK universities' brand name, high demand for English-language higher education, government supported project, promotion by the Department of Trade and Industry
Weaknesses/ threats:	The engagement of departments and faculty. Competes with other online courses offered internationally. Conditioned by funding	Lack of demand for e-learning Complicated governance, conflicting priorities between different stakeholders
Trading opportunities:	National / international	International

Sources: Observer (2004), Observatory on Borderless Higher Education (as cited by Schmoller (2004), "UkeU extract from 'Update on the future of the UK eUniversity – finished as an independent organisation, but dit it have to be this way?". Available at www.schmoller.net/mailings/ukeu.html), UK Parliament (See UK Parliament, House of Commons Hansard, Written Answers for 22 March 2004. Available at www.parliament.the-stationery-office.co.uk).

MODEL 5: Start-up institutions using e-learning		
Examples:	Arab Open University www.arabou.org	Virtual University of Pakistan www.vu.edu.pk/
Budget/finance:	$12 million	Private university set up with $11 million for 4 years. Government funded with student fees
Online cost:	Data not available. Delivering online cheaper than offline.	$11 million for 4 years
Cost structure (e-learning):	Regular course budget. The AGFUND (a regional development institute) provides 70% of total funding and students' fees cover the other 30%	$4.7 million have been allocated for online content. A regular State budget has not yet been developed
Reach:	Regional	National, with some international students from the region
Content:	Buy in from UK Open University with some local adaptation	Creates own content and uses learning management system.
Accreditation:	Arab Open University	Pakistan Virtual University
IT strength:	Integrated use of ICTs in all aspects of university course delivery	Online university offering all courses electronically
Bargaining power:	No data available	Teachers and university management
Partnerships:	UK Open University, AGFUND, UNESCO	Partner with private sector institutions in order to provide access across the whole country
Demand:	High for University Education in the Arab region	High. Strong motivation on the part of students and high student demand
Strengths/ Opportunities:	Regional reach	
Weaknesses/ Threats:	Low skills base, training needed for university teachers, infrastructure limitations. Regional competition from Syrian Virtual University	Lack of quality faculty with local language facility, lack of quality primary and secondary education, pre-university entrance. Lack of face-to-face interaction.
Trading opportunities:	Recruiting students from the Middle East and North Africa; no plans to sell or deliver product	Delivers its courses through a network of private sector partners each with separate ownership. Nationally rather than internationally

Annex II

INDICATIVE LIST OF OPEN SOURCE MANAGEMENT SYSTEMS

Product name	Sponsor/developer	Country of origin	Licence type
Adept	http://adept.sourceforge.net/users/index.html	Russian Fed.	GPL
ATutor 1.2	University of Toronto	Canada	GPL
Bazaar 7	University of Athabasca	Canada	GPL
Bodington	University of Leeds	UK	Bodington System Software License
CHEF	University of Michigan	USA	
Caroline 1.4	Université Catholique de Louvain	France	GPL
CassWeb 2.0	University of California Los Angeles	USA	GPL
Coursework	Stanford University	USA	
dokeos	dokeos	Belgium	GPL
eClass.Net	Tulane University	USA	BSD
eConf	University of Namur	Belgium	GPL
Eduzope/Eduplone	Coalition (Infrae, Plone, others)	Europe	GPL
eLecture Online Lecturing System	Christian and Thomas Lang (Karl-Franzens-Universität Graz)	Austria	
Eedge 1.2	Chuck Wight (University of Utah)	USA	GPL
eTutor	University of Ottawa	Canada	GPL
Fle3	University of Art and Design Helsinki	Finland	GPL
Freestyle Learning	University of Münster	Germany	
GANESHA	Anéma Formation	France	GPL
H2O Project	Harvard Law School	USA	GPL
Ilias	University of Cologne	Germany	GPL
Interact	Christchurch College of Education	New Zealand	GPL
Interactive Learning Environment (ILE)	Brad Cox	USA	BSD/MIT
Internet Course Reader	TeleLearning National Centre of Excellence	Canada	LGPL
Jones e-education V2002	Jones Advisory Group	USA	
KEWL	University of Western Cape	South Africa	
LearnLoop	IT university in Gothenburg	Sweden	GPL
LogiCampus	Tap Internet & Tarrant County College	USA	Custom licence
LON-CAPA	Michigan State University	USA	GPL
.LRN	MIT/Heidelberg	USA/Germany	GPL
OLAT	University of Zurich	Switzerland	Apache style
Manhattan Virtual Classroom 2.3	Western New England College	USA	GPL
MmerDesk 1.5.3.1	Ionstream	Finland	GPL
MnITS Internet Teaching System	Daniel Bartholomew	USA	GPL
Moodle 1.1	Martin Dougiamas	Australia	GPL
OpenCourse	Paul Jones	USA	GPL
Open Learning Management System (O-LMS)	University of Utah	USA	?
OpenUSS	University of Münster	Germany	GPL
Segue	Middlebury College	USA	
Shadownet	University of Missouri-Columbia	USA	GPL
Spaghettilearning.com		Italy	GPL
STeam	Univeristy of Paderborn	Germany	
TextWeaver	San Diego State University	USA	GNU Lesser Public Licence (LGPL)
Uni Open Platform	FernUniversität in Hagen	Germany	GPL
WBT-Master	Graz University of Technology	Austria	GPL
Whiteboard	Todd Templeton	USA	GPL

Source: www.edtechpost.ca/pmwiki/pmwiki.php/EdTechPost/OpenSourceCourseManagementSystems.

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Notes

1. See WTO (2001). Guide to the GATS: An Overview of Issues for Further Liberalization of Trade in Services, Geneva.

2. The following definition is included in Kaplan-Leiserson's e-learning glossary: "E-learning (electronic learning): Term covering a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more". See www.learningcircuits.org/glossary.

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21. See the William and Flora Hewlett Foundation Annual Report 2001, available at www.hewlett.org, and the Andrew W. Mellon Foundation Annual Report 2001, available at www.mellon.org

22. For further information on the impact of the Internet in the publishing industry, see the *E-Commerce and Development Repot 2002.*

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27. For a review of the benefits and implications of FOSS for developing countries, see chapter 4 of the *E-Commerce and Development Report 2003*.

28. For an expanded list of examples of free and open source software relevant to education see UNESCO's Free Software portal www.unesco.org/webworld/portal_freesoft/index.shtml

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30. For a general overview of legal issues affecting online trade see UNCTAD (2000), Building confidence: Electronic commerce and development. Available at www.unctad.org/ecommerce

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33. See, for example, the Observatory on Borderless Higher Education (2002) Online learning in Commonwealth universities, Briefing Note No.7, August 2002. Available at www.obhe.ac.uk