Higher Education Through Open and Distance Learning

Open and distance learning has expanded dramatically in recent years across the world, across the spectrum of subject areas, and across educational levels. This book takes a detailed look at the state-of-the-art of open and distance learning in higher education, and presents a fascinating picture of a world and its educational culture in transition.

This edited collection contains authoritative analyses of key issues together with current accounts of practice in each region of the world. It includes:

- open and distance learning in relation to internationalisation, lifelong learning and flexible learning
- costs of distance education
- the impact of telecommunications
- applications of open and distance learning in Africa, the Americas, Asia, Europe and Oceania.

It draws together experts in the field from all over the world, and has a truly international perspective on the phenomenon of open and distance learning. Its unparalleled breadth of coverage makes it an indispensable work of reference for experts and newcomers alike.

Keith Harry was until recently Director of the International Centre for Distance Learning at the Open University, and is now a freelance adviser.
World review of distance education and open learning
A Commonwealth of Learning series
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The Commonwealth of Learning is an international organisation established by
Commonwealth governments in 1988. Its purpose is to create and widen opportunities
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learning. It works closely with governments, colleges and universities with the overall
aim of strengthening the capacities of Commonwealth member countries in developing
the human resources required for their economic and social development.
World review of distance education and open learning: Volume 1

Edited by Keith Harry
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<td>Asian Association of Open Universities</td>
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<td>AIOU</td>
<td>Allama Iqbal Open University, Pakistan</td>
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<td>BOU</td>
<td>Bangladesh Open University</td>
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<td>BRAOU</td>
<td>Dr B.R.Ambedkar Open University, India</td>
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<td>CCRTVU</td>
<td>Chinese Central Radio and TV University, China</td>
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<td>CIFFAD</td>
<td>Consortium international francophone de formation à distance</td>
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<td>COLISA</td>
<td>Confederation of Open Learning Institutions of South Africa</td>
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<tr>
<td>COMETT</td>
<td>Community in Education, Training and Technology (European Commission programme)</td>
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<td>DEETYA</td>
<td>Department of Education, Employment, Training and Youth Affairs, Australia</td>
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<tr>
<td>DELTA</td>
<td>Development of European Learning through Technology Advance (European Commission programme)</td>
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<td>DES</td>
<td>Department of Education and Science, United Kingdom (later DfEE)</td>
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<td>DfEE</td>
<td>Department for Education and Employment, United Kingdom</td>
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<td>EADTU</td>
<td>European Association of Distance Teaching Universities</td>
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<td>EDEN</td>
<td>European Distance Education Network</td>
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<td>ERASMUS</td>
<td>European Commission programme promoting cooperation in higher education, now subsumed within SOCRATES</td>
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<td>Higher Education Quality Council, United Kingdom</td>
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<tr>
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<td>International Council for Open and <strong>Distance Education</strong> (previously the International Council for <strong>Distance Education</strong>)</td>
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<td><strong>IDP Education</strong></td>
<td>Independent, not-for-profit organisation supporting international activities of Australian <strong>education</strong> institutions</td>
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<td><strong>IGNOU</strong></td>
<td>Indira Gandhi National Open University, India</td>
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<td><strong>KACU</strong></td>
<td>Korea Air and Correspondence University</td>
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<td><strong>LEONARDO DA VINCI</strong></td>
<td>Action programme for the implementation of a European Union vocational training policy</td>
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<td><strong>LINGUA</strong></td>
<td>European Commission programme promoting language learning, now subsumed within <strong>SOCRATES</strong></td>
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<tr>
<td><strong>NOU</strong></td>
<td>National Open University, Taiwan</td>
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<td><strong>NTU</strong></td>
<td>National Technological University, United States</td>
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<td><strong>OECD</strong></td>
<td>Organisation for Economic Cooperaion and Development</td>
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<td><strong>OUHK</strong></td>
<td>Open University of Hong Kong</td>
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<td><strong>PHARE</strong></td>
<td>European Union programme for the economic and social restructuring of the countries of Central and Eastern Europe</td>
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<td><strong>SACHED</strong></td>
<td>South African Committee for Higher <strong>Education</strong></td>
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<td><strong>SADC</strong></td>
<td>Southern Africa Development Community (formerly SADCC—the Southern African Development Coordination Conference)</td>
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<td><strong>SAIDE</strong></td>
<td>South African Institute for <strong>Distance Education</strong></td>
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<td><strong>SICHE</strong></td>
<td>Solomon Islands College of Higher <strong>Education</strong></td>
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<tr>
<td><strong>SOCRATES</strong></td>
<td>European Union action programme for cooperation in the field of <strong>education</strong></td>
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<td><strong>STOU</strong></td>
<td>Sukhothai Thammathirat Open University, Thailand</td>
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<td><strong>TEMPUS</strong></td>
<td>The trans-European cooperation scheme for higher <strong>education</strong>, part of the European Commission PHARE programme</td>
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<td><strong>TSA</strong></td>
<td>Technikon SA, South Africa</td>
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<td><strong>UAJ</strong></td>
<td>University of the Air, Japan</td>
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<tr>
<td><strong>UKOU</strong></td>
<td>Open University, United Kingdom</td>
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<tr>
<td><strong>UNED</strong></td>
<td>Universidad Estatal a Distancia, Costa Rica, or Universidad Nacional de Educación a Distancia, Spain</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>UNISA</td>
<td>University of South Africa</td>
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<td>USP</td>
<td>University of the South Pacific (main campus in Fiji)</td>
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<td>UT</td>
<td>Universitas Terbuka, Indonesia</td>
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<td>UWI</td>
<td>University of the West Indies</td>
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<tr>
<td>YCMOU</td>
<td>Yashwantrao Chavan Maharashtra Open University, India</td>
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**Terms**

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<tr>
<td>CAT</td>
<td>Credit accumulation and transfer</td>
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<tr>
<td>CMC</td>
<td>Computer-mediated communication</td>
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<tr>
<td>CTU</td>
<td>Centre de télé-enseignement universitaire (France)</td>
</tr>
<tr>
<td>CU</td>
<td>Conventional university</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communications technology</td>
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<tr>
<td>ISDN</td>
<td>Integrated Services Digital Network</td>
</tr>
<tr>
<td>KB</td>
<td>Kilobytes</td>
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<tr>
<td>Kbps</td>
<td>Kilobytes per second</td>
</tr>
<tr>
<td>MB</td>
<td>Megabytes</td>
</tr>
<tr>
<td>SLH</td>
<td>Student learning hours</td>
</tr>
<tr>
<td>TAFE</td>
<td>Technical and further education (Australia)</td>
</tr>
<tr>
<td>TMA</td>
<td>Tutor-marked assignment</td>
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</table>
A generation ago, higher education was one of the fastest growing industries in Britain, along with electronics and newly discovered natural gas. Over the last decade, in many countries but by no means all, higher education has been growing more rapidly than ever, faster than the economies that support it. Open and distance learning has been part of that expansion; today, in industrialised and developing countries alike, enrolments at a distance form between 5 and 15 per cent of the total in many cases, over 25 per cent in a few. The purpose of this book is to report on that expansion, examining the ways in which open and distance learning for higher education has responded to the needs of the new society, and summarising the lessons of recent practice for policy-makers and educators. It is just that, a report: not a catalogue (where the International Centre for Distance Learning has a good one online) nor a recipe book (of which there are plenty) nor an academic critique (of which there are a few) but a review from which others can draw conclusions to guide practice.

It has been a turbulent decade, whose turbulence is reflected in its educational history. The collapse of communism brought a necessary reshaping to higher education in eastern Europe. The end of apartheid illuminated the need for South African education to catch up with the outside world, in its institutions as well as its philosophy. The new legitimacy given to private-sector activities in the 1980s is still washing over education. Changes in technology have been more rapid than we remember—few of us used faxes fifteen years ago—and may yet reshape education. Technological change and the forces of globalisation are dissolving frontiers in education, as they already have in culture. Open and distance learning has been influenced, along with the rest of society, by all these changes which are tracked, thematically in the first half of this book, and geographically in the second half.

Higher education has always had a symbiotic relationship with its host community and that community has always extended beyond the walls of the city or the nation. Dusty-footed wandering scholars were the precursors of the internationally mobile students, discussed in chapter 2, whose journeys
are encouraged by international agencies like the European Commission. The 1980s saw the creation of new agencies, in both the Commonwealth and la francophonie to foster international cooperation through distance education. The oddity of this deserves notice. That staid institution, the Commonwealth, derided as an irrelevant imperial hangover, set up not only an international educational agency but one dedicated to a particular form of education. It did so because the techniques of distance education lent themselves to international cooperation and sharing, ideals that are of the essence of the Commonwealth. And so the themes of this book are about the responses of open and distance learning to the changing demands of society, both nationally and internationally, examining the two-way flow of ideas and influence between universities and the world society.

Definitions should help thought rather than limit discussion. We imposed none on our contributors. Happily, the New Oxford Dictionary, a lexicographic tour de force published as we go to press, has given us crisp definitions of open and distance learning: open learning is ‘learning based on independent study or initiative rather than formal classroom practice’ while distance education is ‘a method of studying in which lectures are broadcast or conducted by correspondence, without the student needing to attend a school or college’. One more term is worth citing, though it has not yet crept into the dictionary. In chapter 5 among others we notice that the barriers are coming down between what is done on-campus and off, what is called resource-based learning and what is called open learning: Moran and Myringer, following Australian practice, talk of ‘flexible learning’ to cover the range of activities discussed there and elsewhere.

Remembering that, ‘the examiner never asks you to write down everything you know’, we have commissioned chapters in a way that is selective almost to the point of being eclectic. We report on the main trends within our general theme, but have given more prominence to the less-reported parts of the world, and to the less well-documented institutions. This overview seeks to draw out common threads from those reports, looking in turn at the international changes that have shaped open and distance learning in higher education, at national responses to them, and at institutional change.

**International developments**

Distance education at the end of the twentieth century reflects international economic, political and related ideological change and is shaped by technological opportunity. These changes in turn have begun to create something new, a set of formally articulated regional and international policies for education.
Economic and political change

Two economic forces, with a complex link between them, have shaped the demand for opportunities to study in non-conventional ways. In the industrialised countries, demand for education for an increasing proportion of the population has resulted in the expansion of higher education and the demand for new approaches to it. Structural unemployment has probably increased the demand for higher education, reflected in the experience of Australia and Canada. Demands for retraining have encouraged universities to seek new audiences and new styles of working (chapters 4 and 5). Meanwhile, until the Asian financial crisis that opened in 1997, demand for higher education in the newly industrialised countries has been powered by the earlier expansion of primary and secondary education and by the job opportunities offered to those with higher education. Distance education has provided a way of recruiting more students and of shifting the balance of expenditure on education away from the state and towards the learner.

The political changes that shape education are most sharply illustrated in eastern Europe and in southern Africa. As chapter 10 describes, political change in eastern Europe swept away a system of distance education, based on correspondence courses, that was associated with the former regime. Universities are reshaping themselves to work in the new Europe, sometimes remembering the structures of sixty years ago. In doing so they are trying to create a new system of distance education that can respond to national needs, but learn and borrow from the west. Changes in southern Africa are even more dramatic. The end of apartheid has brought in its turn changes to the politics of education both nationally and regionally. Within South Africa formal changes are reflected in a White Paper on education, setting out new goals and laying proper stress on quality. Ideologically, South Africa is still struggling to rid its educational thinking and practice of the so-called ‘fundamental pedagogics’ which attempted to rationalise apartheid (cf. Gultig and Butcher 1996:88). Distance education is seen as one way of increasing the access to education which is a necessary part of national regeneration. In the wider region of southern Africa, there are new opportunities for cooperation: chapter 7 explores the difficulties of establishing a cooperative structure that recognises the economic realities of South Africa's domination, and the proper interests of the small population countries of the sub-region.

One ideological change has influenced open and distance learning all round the world. A generation ago, education was seen as essentially a public-sector activity. Some countries restricted or banned private schooling. The creation of the British Open University was, above all, a dramatic move to widen the gates of the university but it was also a statement about proper public involvement in distance education, until then dominated by the private sector. In the 1980s all that changed, with the private sector given a new stake and a new legitimacy, in education as in other areas of public life. In
distance education, the private sector is seizing opportunities in central and
eastern Europe, sometimes acting more rapidly than the public sector. In
Australia, distance education is being influenced by demands from and
competition with the private sector, with repercussions for the structure of
higher education (chapters 4 and 11) while the government elected in 1996
had an increased ‘commitment to the power of market forces in higher
education’ (p. 273). In western Europe, too, industry is demanding better
access to courses for professional training and continuing education. One
model is the joint development by partners from the public and private
sectors of customised training programmes using open and distance
learning (chapter 4).

Technological opportunity

Extramural and correspondence education developed, after a timelag, once
railways were in place to move lecturers and support cheap post. Distance
education, linking broadcasts and correspondence, grew up, after another
timelag, with the coming of educational television. In chapter 3 Mason
explores how telecommunications are beginning to change open and distance
learning. The early experience is mainly from industrialised countries where
telecommunications are allowing easier and more frequent interaction between
tutors and students, and allowing universities to reach new audiences: the
National Technological University in the United States exists because it has
access to satellite communication.

Our crystal ball is too cloudy to forecast the pace at which the newer
technologies will be available and adopted for education. From China comes
a prediction that advanced technology will make inroads into traditional
education both in China and worldwide. The National Open University in
Taiwan is already experimenting with the use of computer-based commu-
nication. The newly established Open University of Catalonia is one of the
world’s first virtual universities, using computer-based technology as the
main way of providing courses for its students. The planned African Virtual
University may yet make teaching available to Tanzania. The regional
universities of the South Pacific and the West Indies, which have made use
of telecommunication links between their scattered communities since the
first communication satellites, are actively exploring ways of strengthening
their existing systems. Use of the Internet may help solve the problems of
educational isolation in small island developing states as well as in the rich
industrialised world.

And yet, the scale of all this is modest. For much of the world, print,
sometimes supported by broadcasting or by the use of cassettes, dominates
open and distance learning. Indeed, institutions have often reduced rather
than increased their use of broadcasting over the last ten years as free or
subsidised access to broadcasting has declined. The newest open universities
discussed here—of Bangladesh and Tanzania—will be using print with some broadcasting support as their main teaching media. Access, in two senses, is all-important to plans for the use of media. In Bangladesh for example: adequate access to broadcasting time for the institution and access by students to radio or television constrain the choice of media (p. 169–70).

Changes in technology always mix opportunity and threat. One thread that runs through the world experience is the potential that the technologies have for changing universities, for helping them to reach new audiences, and for shifting the boundaries between what is seen as on-campus and off-campus education. Moran and Myringer (p. 59) refer to a ‘three-way convergence of distance and face-to-face education and electronic technologies’, made possible—inevitable perhaps—by the use of the new technologies which they see as triggering change within institutions as well as beyond them. There may be threats to existing university structure and ways of working here. But, from the standpoint of an international review, the international threats demand highlighting. Whereas, within frontiers, there are usually structures for the regulation or self-regulation of university activities, there is less regulation across frontiers and less still in cyberspace. Blight, Davis and Olsen (chapter 2) identify the problem and note that Australian vice chancellors have drawn up a code of practice for the overseas activity of their universities. (Regulatory frameworks are still in their infancy within national boundaries in eastern Europe, never mind beyond.) But it remains to be seen how far codes are followed, or enforced. We have little in the way of consumer protection for the virtual student and there is a danger of an educational Gresham’s law operating. A potential student, considering enrolling on an electronic course available from a foreign country, has little way of knowing whether the provider is legitimate or bogus or of assessing the quality of what is on offer. (Hong Kong has begun to develop structures that are relevant here (p. 196).)

There is a warning from the south Pacific that the issue is one of culture as well as regulation. Materials and courses, offered through the new technologies, are culture-laden. While new networks of information may widen access to education, they can also threaten the indigenous institutions of higher education which have grown in strength, stature, and service to their host communities over the last quarter-century. It would be ironical if technology, that could provide educational resources not otherwise available to them, were at the same time to weaken the independence and local relevance of the remoter institutions of the south, and the cultures that sustain them. The second chapter, on internationalisation and its impact on open and distance learning, is an early word in a debate which needs vigorous encouragement.

Changes in technology change costs. Mason hints (chapter 3) that new technology may widen audiences and so bring down unit costs but warns that ‘many practitioners have concluded that telecommunications systems
do not save money in the long run’ (p. 45). Hülsmann reinforces that warning with his not unexpected comment that the basic cost of preparing a text is always with us, and other technologies, whether they are used to distribute resources or to encourage interaction, have all tended to increase unit costs over the minimum needed for a text.

**Regional and international policy and development**

The world started creating structures for the sharing of educational experience, with the foundation of the Association of Commonwealth Universities in 1913 and the International Bureau of Education in 1925. Reports by UNESCO, policy documents from the World Bank, formal statements by regional agencies all sit so firmly on the educator's bookshelf that we forget how recent is the concern for international policy in education. Within distance education, and with the exception of the work of the Commonwealth of Learning and of CIFFAD, whose geography is governed by language not proximity, the main developments have been regional rather than international.

Europe has given a lead. There are references in chapter 2 and chapter 10 to the European Union’s steadily increasing influence on the development of open and distance learning. It is seen as a means both of strengthening European integration and of supporting economic competitiveness, and is referred to specifically in the Treaty of Maastricht. The PHARE and TEMPUS projects have brought eastern Europe into the same ambit. Informal structures exist alongside the formal European ones but the activities of the European Commission, and its control of a budget for cooperative activities in open and distance learning within Europe, give it a regional presence unmatched in any other part of the world.

The two regional Commonwealth universities have formal structures for cooperation, designed to support education in states that would otherwise be too small to support national universities. In the Caribbean, one of the drivers of expanded activity in distance education has been a concern for equity between the campus and non-campus territories. In the south Pacific, with much greater distances and a more limited educational infrastructure, distance education has developed so far, and demonstrated its relevance to the educational needs of its scattered region so dramatically, that a majority of the students of the university do some or all of their degree at a distance. The ownership of the universities by their supporting territories symbolises their cooperative structure.

Elsewhere, cooperative structures are more informal. A Distance Education Association of Southern Africa, for example, goes back to the 1970s (as the Botswana, Lesotho and Swaziland Correspondence Committee) and has promoted modest cooperation between the institutions in the five countries of the region, operating somewhere below the level, and the political complexity, of formal government-government cooperation. In Latin America,
regional agencies provide for cooperation between the rectors of universities using *distance education*, for developing television materials, and for exchanges in telematics and staff training. Within their continents the Asian Association of Open Universities and the European Association of Distance Teaching Universities have, in the same way, provided informal opportunities for exchange and cooperation.

Of course barriers to cooperation remain. Some are legal: there are difficult issues concerning intellectual property rights which are inhibiting cooperation within central and eastern Europe. In some cases there is a lack of trust between institutions in neighbouring countries. The ‘not invented here’ syndrome still operates and has hindered otherwise encouraging cooperative developments across frontiers in Southern Africa (p. 99). But the experience generally suggests that regional cooperation is likely to grow, driven by the search for resources, by technology, and by the developing frameworks designed to facilitate it.

**National responses**

Governments have invested in open and *distance* learning for a mixture of reasons, including educational access, equity and responding to the demands of the labour market or their expectations about economic competitiveness. The emphasis of the last decade has not so much been on the establishment of new institutions, though Bangladesh and Tanzania are important exceptions, but upon quality, upon new tasks for higher *education*, and upon costs and funding.

The concern for quality is double edged. Open universities, and dual-mode institutions offering flexible-learning courses, are concerned with parity of esteem between the two modes. There is still scepticism about the legitimacy of *distance education* in countries as different as Swaziland, China and Canada. Within Europe, open and *distance* learning is still struggling to gain acceptance and respect and is sometimes ignored by the conventional university system. One job to be done therefore is to establish that the quality of open and *distance* learning can match that of conventional university teaching. Scepticism needs also to be cut away with the other edge of the sword, aimed at inferior practice within open and *distance* learning. Despite the restructuring of *distance education* in South Africa, the educational quality of what is being offered is still the subject of severe and proper criticism (p. 103). One part of national policy is to develop measures for raising the quality of what is being offered to the public as *distance education*. India, for example, has designated the Indira Gandhi National Open University as an apex institution, concerned with quality throughout the *distance education* sector.

In many countries higher *education* is being asked to undertake two new tasks: to reach wider audiences and to give new emphasis to continuing
education. The governments of Bangladesh, Taiwan and Tanzania have all invested in distance education principally to widen access. As noted above, the University of the West Indies is expanding its system of distance education to make better opportunities available in the eastern Antilles. In India there is concern that the open universities should in fact provide improved access to students from scheduled castes and scheduled tribes. This kind of concern has been a common thread through the debates about distance education for many years. It may no longer be the main driver, at least in some jurisdictions: it is suggested (p. 264) that Australian institutions are today moving towards flexible learning not so much in the interest of equity as of institutional viability. A task that has a new prominence is to help universities respond to a changing demography of students which is ‘partly a function of the shift from elite to mass higher education, and partly a consequence of a growing demand for recurrent, lifelong education’ (p. 58). Many of the institutions reported here have developed new programmes, part-time programmes, and alliances with employers in order to respond to these twin needs. The new prominence given to the concept of lifelong learning during the 1990s means that almost every university mission statement now contains a specific commitment ‘to develop lifelong learners’ (p. 49). Swedish universities have a specific responsibility to ‘meet their obligations to serve labour market needs especially through distance education and continuing professional education’ (p. 58). In chapters 4 and 5 we examine how these developments are changing the functions of universities and changing the relationship between a university and its students. The concern is universal: it affects the structure of higher education in China, the South Pacific and the Caribbean as well as in the industrialised north.

The search for new audiences, and the response to their needs, has been matched by a concern for the costs of meeting them. Hülsmann (chapter 6) pulls together evidence that suggests open and distance learning can often have costs per student lower than those of conventional education, but warns against easy assumptions about savings that might be achieved. The resolution of questions about cost-effectiveness is seen as critical to the future of the Open University in Bangladesh (chapter 9). In South Africa, the concern about quality is matched by a concern about cost-effectiveness and the danger that the apparent cost advantage of distance education may be eroded by low completion rates.

Governments have found distance education economically attractive not only because it can achieve economies in capital (fewer costly new campuses) and recurrent costs (reduced wage bills for teachers) but also because it may allow education to be funded differently. Many Asian open universities draw a larger percentage of their income from student fees than do conventional institutions; India offers one example (p. 205). In industrialised countries there is a trend to shift more of the costs of open
and distance learning on to the student. There is a conflict between pressures to fund an expansion of education in this way and to seek increased equity within it. In Europe, new partnerships between employers and universities may offer a channel for funds to flow from the private into the public sector where tailor-made courses are available through open and distance learning.

Institutional change

For about twenty years the literature, partly reflecting practice, was dominated by the establishment of distance-teaching or open universities. There was one in 1969, about a dozen within ten years and double that number by 1990. New open universities are still occasionally being established: chapter 7 describes the early days of the Open University of Tanzania and chapter 8 those of the Open University of Bangladesh, seen as the only possible form in which distance education could be developed there (p. 165). The National Open University in Taiwan has recently acquired a new status in which, for the first time, it can award full degrees (p. 217). But the general pattern is for conventional institutions to introduce distance education in some form and it is the progress of these dual-mode institutions which dominates accounts of institutional change.

Jurisdictional differences are important here. In Australia, higher education is predominantly the responsibility of the individual states, not the Commonwealth government, while Canadian provinces jealously guard their sole responsibility for education. One consequence is that distance education in both countries has been dominated by dual-mode institutions. King discusses the attempts by the Commonwealth government to rationalise distance education, and to establish a new Open Learning Agency which was to operate in harmony with individual universities and with funding from both private and public sectors (p. 269–70). In eastern and central Europe, too, universities have explored the possibility of becoming dual-mode: no government has chosen the option of setting up an open university. Reviews undertaken by the Commonwealth of Learning reached the same conclusion in the South Pacific and the Commonwealth Caribbean; wise development of distance education there needed to rest, as it has, with the existing regional universities (Renwick et al. 1991 and 1992).

Three factors have encouraged a convergence between open and distance learning on the one hand and conventional education on the other. One is the drive for dual-mode status: if an institution is teaching both on- and off-campus there are educational and economic benefits for it to look for ways in which the two modes can reinforce each other. A second factor, already touched upon, is technology. If, for example, a university is investing in computer-based teaching material, with the heavy staff costs that this entails, it is likely to look for potential users both within its classrooms and outside. The third
benefit is the need to meet the demands of new audiences: part-time students, learners wanting to get just-in-time professional updating (pp. 51–52), companies interested in new kinds of university-industry partnerships are all likely to be sympathetic to a flexible approach to learning. And so we see convergence of this kind in China, in eastern Europe where information and communication technologies may be hastening educational change and in Canada where the distinction between face-to-face and distance education is being eroded ‘with the blending of teaching methods through digitally based telecommunications technologies’ (p. 160). In Australia, ‘throughout the last decade, the boundary between conventional on-campus teaching and distance and open provision has markedly blurred, leading to the widely used redesignation “flexible delivery”’ (p. 274). Linguistically at least, where Australia leads perhaps we will all follow.

This process of convergence is likely to affect the distance-education student and institution. Already, in many jurisdictions, it is easier for students to move between modes of study within a single institution than to carry credit from an open university to a conventional one. At the same time, even where students cannot readily move, teaching materials may do so. Tanzania provides an example where materials developed for distance education are being used within conventional institutions (p. 120). It may indeed be that there will be more profound effects on universities: Moran and Myringer suggest that ‘distance education methods and systems are converging with those of face-to-face teaching, strongly influenced by new electronic technologies’ and that this will transform university teaching and learning as a whole. It may, too, be accompanied by new attempts at cooperation between institutions, driven by the search for resources and enabled by flexible learning.

Universities never were ivory towers: the hard-headed city corporation of Edinburgh ran the university until 1858. Its ramparts were as impressive as those of Paris, Bologna or Oxford but it met the needs of its citizens. The policies of the open universities and dual-mode universities of the 1990s are being shaped at least as much by the exogenous pressures of international change and national policy as by these endogenous changes of policy and practice.

**Coda: Where are they now**

Nearly twenty years ago the new open universities were of enough interest for an overview to be published of nine of the first of them (Rumble and Harry 1982). Much has changed since then. The book discussed the different model of distance education in the Soviet Union and Eastern Europe. It predicted some future for distance education within dual-mode institutions but saw this as of less significance and appropriate only where the population did not justify the establishment of a dedicated open university. Today, Baumeister (p. 247) notices that the widespread development of dual-mode
Institutions in Europe contrasts with the expectations in 1982. The earlier book asked whether the new universities would survive, noted that ‘all non-traditional educational structures are characterised by fragility’, but saw as a good omen that they had collectively survived political changes that threatened them (Keegan and Rumble 1982:243). The forecast was sound. All nine (in Britain, Canada, China, Costa Rica, Germany, Israel, Pakistan, Spain and Venezuela) have survived and have in each case become part of the normal educational service of their countries. Survival is no longer an issue. The idea, however, that the future lay mainly with the open universities is belied by the changes of the last decade. Open and dual-mode universities are now both major players.

The appraisal of their work was in terms of three main themes: their quantitative achievements, their quality and their costs. In terms of quantity, the total number of students using open and distance learning has grown hugely in twenty years. Distance education is significant enough as a mode of higher education for the UNESCO Statistical Yearbook to include figures that show Thailand and Turkey, for example, with a remarkable 41 and 38 per cent of higher education students in 1992 studying at a distance. But, in this volume as elsewhere, we have only limited data on success rates: a previous Commonwealth of Learning report made the point that ‘if open universities are to advocate a different funding structure or to bid for more funds they will also need to make their case by producing fuller data than have usually been available on completion rates and costs per graduate’ (Mugridge 1994:121).

The theme of quality runs through this book as it did in 1982. The chapters in this volume report much progress in measures to check and ensure quality: there is an expectation that we are teaching our students better than we were. At the least we have more formal systems that attempt to check for quality. The earlier volume noticed that lifelong learning was among the objectives of the distance-teaching universities but interpreted their role much more in terms of individual access to education than of contribution to the workforce and to human resource development, the themes of the late 1990s.

We have learned more about costs in the last twenty years and been able to put some glosses on to the arguments about the possible cost advantages of non-conventional study. One change since 1982 is in the context of the debate; it is now about cost recovery as well as about cost savings.

Finally, the earlier review looked forward, as we still do, to the exploitation of technology, hoping that in the long run the distance-teaching universities will use ‘electronic means of communication to provide individualised educational systems capable of giving rapid feedback to persons who are part of a dispersed, heterogeneous student population’ in order to respond to the needs of learners of the twenty-first century (Keegan and Rumble 1982:248). We still want the technology, and the responsiveness. The world’s
achievements in open and distance learning, reported here, can tell us a lot about how we may yet attain them.

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The internationalisation of higher education

Denis Blight, Dorothy Davis and Alan Olsen

Open learning and distance education are borderless in concept. There are few boundaries on the locations of their students and, increasingly, open learning and distance education cross national borders. Some 1998 examples: the British Open University has 25,000 students taking courses outside the country (Daniel 1998); it is reported to be opening its doors for business in the US (The Australian, 6 May 1998); of the 79,800 international students in Australian universities 6,500 were off-campus and 15,800 at off-shore campuses (IDP Education Australia 1998:2). Does the fact that open and distance education is delivered across national borders lead to demand for internationalisation of its content? Does internationalisation of the content of open and distance education lead to demand for its borderless delivery? And what of quality? If delivery is across borders, what control or assurance is there in terms of quality, relevance, support of students, recognition and accreditation? Does borderless delivery lead to globalisation of accreditation? Moreover, does technology change the teaching and learning delivered through open and distance education? Is technology an ally in borderless delivery but a threat in terms of intellectual imperialism?

The first section in this chapter outlines developments in the internationalisation of higher education; the second looks at international delivery of open and distance education; the third reviews the application of new technologies; and the fourth highlights issues of quality, student support, curricula, costs and concerns of internationalisation and globalisation.

Internationalisation

International higher education has traditionally involved students from one country studying on-campus at universities in another country. De Ridders-Symoens (1992) describes the impact of the mobility of students and scholars in the Middle Ages:

The use of Latin as a common language, and a uniform programme of study and systems of examinations, enabled international students to
continue their studies in one ‘studium’ after another, and ensured recognition of their degrees throughout Christendom.  
(De Ridder-Symoens 1992:281)

Moving to our own time, IDP Education Australia in 1995 (Blight 1995) studied future demand for higher education. Changes in enrolments over time reflect changes in population and changes in participation rates. The IDP study modelled population change and participation rates to the year 2010, and further out to 2025. It showed that population growth over the next thirty years will not have a major impact on enrolments. Changes in participation rates will make a much greater contribution; they tend to vary with changes in per capita income so that, as incomes rise, demand for higher education places grows. The study forecast that global demand for higher education places would increase from 48 million in 1990 to an estimated 97 million in 2010 and 159 million in 2025.

**International student mobility**

As demand for higher education places grows, so the number of higher education students at universities outside their home countries is growing. UNESCO estimates that from 1970 to the mid-1980s the number grew from 500,000 to 1 million and by the mid-1990s to 1.5 million (UNESCO 1997: Table 3–14). This increased student mobility is a function of economic demand for higher education. The United States dominates as a host country with 30 per cent, followed by France (11 percent), Germany (10 per cent) and the United Kingdom (9 per cent). In the mid-1990s, 46 per cent of these students were from countries in Asia and 63 per cent of these students from Asia travel to English-language destinations (UNESCO 1997: Table 3–14). IDP predicted (Blight 1995:9) that the number of international students would rise to 1.8 million by the year 2000 and to 2.75 million by 2010. Asia was expected to demand an additional 800,000 international university places in the fifteen years 1995 to 2010. Despite any short-term impact of the Asian economic crisis of 1997, it is expected that the longer term predictions will stay firm.

Essentially, this increased student mobility is a function of economic demand for higher education. The increased mobility has been assisted and promoted by a number of national, international and regional initiatives such as NAFTA education programmes, ERASMUS (followed by SOCRATES) in Europe, and the UMAP (University Mobility in Asia and the Pacific) programme in the Asia-Pacific region.

**Internationalisation of higher education institutions**

International student programmes are central to the internationalisation of tertiary-education institutions. They add diversity to institutions and to their
local communities. They influence the research interests of staff, and over time influence the curriculum. They may start a flow of funds to other international programmes.

The scope of internationalisation in the 1990s, however, means a lot more than an international student programme. Knight (1997:8) suggests a process approach to internationalisation of the core functions of a university where 'internationalisation of higher education is the process of integrating an international/intercultural dimension into the teaching, research and service of the institution'.

Why do stakeholders in higher education worldwide—governments, institutions, including staff and students, and community, including business and industry—seek to integrate international and intercultural dimensions into the core teaching, research and service functions of universities? Knight (1997:9) categorises the reasons for internationalisation into four groups: political, economic, academic and cultural/social.

First, governments of nations have political incentives, including the commitment of the nation to a global economy and society, its openness to the world, its commitment to its region and its commitment to development assistance to the world and to its region. Second, economic incentives for a nation include the value of education as a service export and, for the community also, the labour market need to train students to operate in international and intercultural contexts. At the level of the individual institution there are financial incentives through international student fees. Third, the institution and the community, including business and industry, have academic incentives for internationalisation. There is an assumption that 'by enhancing the international dimension of teaching, research and service there is value added to the quality of our higher education systems' (ibid.: 11). An international academic approach attempts to avoid parochialism. An interaction with other cultures is important in the development of students. Universities have the opportunity to increase awareness and understanding of the new and changing phenomena that affect the political, economic and cultural/multicultural developments within and among nations (Knight and de Wit 1995:12–13). The nation’s own students and the community benefit from an international curriculum. Finally, the institution and the community have cultural and social incentives for internationalisation. Internationalisation of the student population adds cultural diversity to an institution and its community, leads to a demand for international exchanges and familiarises the nation’s own students with the world and with their region.

**Strategies for internationalisation**

The international student programme of an institution is seen as one of several strategies for internationalisation. In the Australian context, Back *et al.* (1996)
carried out a comparative study of the internationalisation activities of higher education institutions, examining seven themes:

1. an organisation strategy for internationalisation;
2. international student programmes;
3. the internationalisation of teaching;
4. off-shore and distance education;
5. internationalisation in research;
6. international technical assistance and training;
7. providing international student support services.

The organisation strategy for the process of internationalisation of an institution includes the internationalisation context, culture and policy of the institution, its mission statements and corporate plans, its management and business plans, its organisation structure for internationalisation, its staff policies and its institution-wide links.

An international student programme is central to internationalisation. Considerations include the number and proportion of international students enrolled, and institutional policies on enrolment targets, geographical focus, fields of study, scholarships, distribution of fee income, modes of delivery, including off-shore and twinning arrangements, the use of multimedia and distance-education methods, and the provision of promotional information.

Perhaps the most significant component of the internationalisation of teaching is the internationalisation of the curriculum which, if implemented effectively, ensures that the academic benefits flow not only to the international students but also to the institution itself and to its domestic students. An internationalised curriculum is particularly relevant to international students studying off-shore. Alongside curriculum issues, internationalisation of teaching includes staff exchanges, study abroad and student exchange programmes, joint degrees, credit-transfer arrangements, the development of specialist centres that focus on relevant foreign language and cultural studies and the institutional links which facilitate these initiatives.

Internationalisation in research involves a wide range of collaborative projects, institutional links and exchange programmes. These activities make extensive use of the Internet and other applications of information technology. International technical assistance and training projects, often funded by aid agencies and multilateral organisations, apply the expertise of institutions to multidisciplinary problem-solving in an international setting. Student support services are also a crucial element of an institution’s internationalisation strategy. Institutional responsibilities for the support of international students are usually described in formal codes of ethical practice designed to ensure that adequate provision is made for a full range of support services to international students.
Internationalisation strategies make up a dynamic and integrated set. Developments in one internationalisation activity can lead to opportunities in another. Back, et al. (1996:17) suggest links between an international student programme, the international research interests of academic staff and the internationalisation of teaching. A new course offered internationally through the Internet may result in links with institutions and staff in countries other than those that have been the traditional partners. Student and staff exchange programmes may lead to international research collaboration.

**Internationalisation of distance education and open learning**

Off-shore and distance education make up one of the internationalisation programme strategies of a higher education institution. Distance education and open learning have been subject to four internationalisation influences. First, approaches and methods, developed in one national system, have been adapted and adopted by other national systems. Second, as a matter of strategy, the European Union is supporting projects in open and distance learning. Third, the catchments of distance education institutions have been steadily expanded from local and national to regional and international locations. Fourth, distance education materials and approaches have been utilised in twinning programmes and at off-shore campuses.

**Adaptation and adoption of distance education across national borders**

Distance education and open-learning approaches developed in one national system have been adapted and adopted in other national systems at an increasing pace over the last thirty years.

The provision of distance education had largely been confined to a few developed economies and to China, until the open learning movement was stimulated by the foundation of the UK Open University in 1969, and its then innovative use of broadcast public television as a core element of its teaching practice.... Developing countries were also encouraged by the immediate popular success of the UK Open University, and its demonstration of the efficacy of broadcast television-radio-print, at least in a small geographic area serviced by a national broadcaster and a dense population with appropriate reception equipment. China TV University demonstrated that broadcast media could also be effective over a large geographic area.

It is crucial to acknowledge the core role of government in establishing distance education institutions. As Daniel (1995:17) points out, the
‘mega universities’ (over 100,000 students) were created ‘with clear policy goals in mind, above all to increase access to higher education at low cost’.

(Cunningham et al 1998:30–2)

**European Union strategy**

The European Union has been promoting the internationalisation of education. The Treaty of Rome provided for mobility of labour within member countries. This led in turn to a concern for the recognition of qualifications across frontiers and to support for student mobility: the aim of the ERASMUS student mobility programme was for 10 per cent of university students to have the opportunity of studying abroad. The European Commission then moved on from actual mobility to consider virtual mobility. The Commission had already been supporting experimental work in telematics, seen as being of potential economic benefit to Europe. As a result of these twin interests, in education across frontiers and in the application of telematics to education, the Commission made a formal decision to support projects in open and distance learning. Since 1995 the European Commission has been funding cooperative projects that involve partners in three or more European countries through open and distance learning. This work is now beginning to extend into eastern Europe and will continue into the next century.

**The widening catchment of distance education institutions**

The catchment of individual distance education institutions has steadily widened in the last decade. This widening has been driven by the same factors that had led to the internationalisation of universities. An additional and important factor has been the availability in recent years of new information and communication technologies.

The British Open University has sought international markets, and ‘had 13,000 students outside the UK in 1994, mostly in the European Union, Hong Kong, Singapore and the former Soviet bloc’ (Cunningham et al. 1998:30). Today the number has increased to 25,000 in ninety-four countries and using four hundred examination centres (Daniel 1998).

The specific mandate of the Commonwealth of Learning, established in 1988 with its headquarters in Canada, is to encourage the development and sharing of distance education materials, expertise and technologies for students throughout the Commonwealth and other countries. The Expert Group, whose report led to its establishment, saw as a long-term aim of the Commonwealth of Learning that any learner, anywhere in the Commonwealth, should be able to study any distance-teaching programme available from any bona fide college or university in the Commonwealth (Briggs et al. 1987).
Off-shore campuses

Distance education is one part of a spectrum of flexible delivery. The traditional distance education model in Australia is predicated on isolated students. It is resource based with little, if any, regular face-to-face teaching, although students may be brought together once or twice per year for ‘residentials’—short periods of intensive teaching on-campus. In Europe and North America some distance education is resource based, while some universities have adopted a different model in which students are collected as a class in dedicated facilities at a satellite campus and are taught by videoconferencing (Cunningham et al. 1998:24).

British and Australian universities have developed off-shore campus models extensively, in countries such as Singapore and Malaysia, to offer twinning programmes. As described by Lewis and Pratt (1996:211), the general characteristics of a twinning programme in Malaysia tend to be:

- a local private college provides the equity for campus and buildings, the administrative infrastructure, employs local academic staff and is responsible for obtaining approvals from the Ministry of Education;
- a foreign sponsoring university provides intellectual property in curricula and academic staff expertise;
- students spend one or two years studying at the local private college in Malaysia, while concluding their degree study in the final year(s) at the foreign university;
- the degree is granted by the foreign university.

In Australian universities in 1997, 20 per cent of international students were at off-shore campuses (IDP Education Australia 1998:2). Lewis and Pratt (1996:211) describe the popularity of these programmes, where, along with other international links, ‘around twenty Australian universities [there are thirty-eight in total] currently have some form of twinning arrangement with a private college in Malaysia, either on a one-to-one joint venture, or via a consortium’.

Back, et al. (1996:55) used the Royal Melbourne Institute of Technology (RMIT University) as a case study and identified five types of cooperation in a study of twinning. Asia’s economic and financial crises of 1997–8 have added to demands for programmes enabling students to study in their own countries for at least part of their courses which leads to a sixth type. They are:

- programmes carried out off-shore with local partners to upgrade local diplomas to RMIT degrees;
- programmes carried out off-shore with local partners to offer RMIT undergraduate or graduate programmes;
• programmes involving one or two years at an off-shore twinning partner followed by one or two years onshore at RMIT;
• distance education programmes offered in conjunction with local partners;
• the provision of course materials for programmes to be offered off-shore by other education institutions or organisations;
• programmes offered totally at off-shore campuses.

The spectrum of flexible delivery is complete when on-campus students use resource materials developed for distance education. Deakin University in Australia provides an example. Since its foundation it has been university strategy to provide distance education with flexible delivery. Students did not need to attend a study centre, and there was no requirement for residential. Deakin University describes its flexible course delivery:

All Deakin students have choices about the way they study. The traditional distinction between on-campus and off-campus has been super-seded at Deakin by flexible course delivery. A flexible approach to course delivery means choosing the best teaching methods and the best technologies to provide real choices for students in the mode, place, time and duration of their study.

Technology in international education

IDP Education Australia in 1996 commissioned research on Technology in International Education which described the merging of information technology and telecommunications.

The combination of information technologies and telecommunications has meant that world events are no longer localised, but spread around the world within a split second via technologies ranging from Email to satellite video links. For those with access to these technologies, the global village has arrived.

This global transmission of information is not restricted to current events, but extended to learners from kindergarten to senior citizens who, although they may live in the United Kingdom, participate in learning experiences delivered from other countries in Europe, the United States or Australia, for example.

Information technologies and telecommunications build on existing distance education courses by adding value to the design of internationalised learning experiences.

(Alexander and Blight 1996:20)
Approaches to international study

The report described case studies that exemplified the state of the art in the use of technology to internationalise teaching, through the content or form of the curriculum, for language learning, for virtual international mobility and for international delivery of distance education and lifelong learning. It identified five case studies in the delivery of distance education and lifelong learning, which actually or potentially allowed for international study.

- ‘Deakin Interchange’, from Deakin University in Australia, was a suite of software for accessing a variety of networked services at the university with an easy to use graphical interface. It allowed access to these networked services either by direct network connection on campus or via modem from off campus locations (Alexander and Blight 1996:40). In 1997, Deakin Interchange was replaced with a web-based platform of delivery using local Internet service providers.

- The Graduate Certificate in Open and Distance Learning from the University of Southern Queensland in Australia is a course which is offered solely via electronic media. It was developed for academics and trainers needing professional graduate education in the use of open and distance learning techniques. It incorporates flexible-learning techniques and explores real learning systems. The learners participating are staff working in organisations involved in open and distance education in Australia, Brazil, Canada, Hong Kong, Malaysia, Mexico, Solomon Islands, South Africa and USA (ibid.: 44).

- ‘On Line and Distance Learning’ is an elective subject for students studying educational technology at the Faculty of Educational Science and Technology at the University of Twente in The Netherlands, most of whom are studying at Master’s level. The students, from eight countries, are engaged in exploring the design and creation of materials for the support of tele-learning, and in particular materials for access via the worldwide web (ibid.: 47).

- ‘Teleteaching 96’ was a virtual conference held in conjunction with an on-site conference of the International Federation for Information Processing, the theme of which was ‘Practising what we preach’. Several months ahead of the on-site conference, delegates were directed to a specially developed website where a number of international experts in aspects of virtual universities posted papers for discussion, as well as links to selected locations which illustrated the practices and theories under discussion. For two months, virtual participants discussed issues,
ahead of the on-site conference, where small groups of participants discussed the issues raised in the virtual conference (ibid.: 57–8).

- The ‘Knowledge Media Stadium’ is a desktop platform, developed by the Knowledge Media Institute at the UK Open University for the purpose of hosting electronic events around the globe. The Institute has the aim of defining the future of lifelong learning by harnessing and shaping the technologies which underpin it. The Stadium is used as a hardware and software platform for professional update master classes, international symposia, syndicates, town meetings, specialist and celebrity netcasts and hindsight analysis of an event in detail after it has taken place (ibid.: 60–2).

**Distance education and lifelong learning**

In Deakin Interchange and Knowledge Media Stadium, Alexander and Blight (1996:9) describe two common desktop software platforms from which a number of different courses or learning experiences are delivered. The Graduate Certificate in Open and Distance Learning, On Line and Distance Learning and Teleteaching 96 exemplified the design, development and delivery of international education at the level of a whole course, a subject and a conference.

In respect of distance education, Alexander and Blight conclude from an Australian perspective:

Developing a capacity to deliver courses internationally is of critical importance to all levels of education in Australia, with benefits which include improved educational outcomes for students, economic sustainability, and humanitarian factors. The possibilities for information technologies to deliver international education are appealing, because of their potential to overcome Australia’s geographic isolation.

(ibid.: 9)

**Policy issues**

A number of policy issues need to be addressed in the context of the internationalisation of higher education. They include questions of quality and student support, of the content and form of curricula, of intellectual imperialism and the globalisation of accreditation, and of access.

**Quality and student support**

International delivery of distance education and off-shore campuses raise specific issues of quality assurance and student support. Lewis and Pratt
(1996:215), discussing the need for new ‘distribution channels’ for international business education, suggest the need for international business schools as separate multinational business corporations: ‘The challenge will be to achieve this without eroding academic standards and educational quality’.

The new distribution channels include the international delivery of distance education, off-shore campuses and twinning programmes, often involving the use of new technologies in delivery. In the Australian context, Back, et al. (1996:129–32) surveyed universities on their use of new technologies and on their quality assurance programmes. Most universities used technology such as the Internet, including all seven universities with off-shore campuses, twenty-two of twenty-five universities with twinning programmes and all twenty-two universities involved in international delivery of distance education. Few universities had specific quality assurance programmes. Of seven universities with off-shore campuses, five used the same quality assurance programmes for teaching and learning at off-shore campuses as at Australian campuses while two had specific programmes. For twinning programmes, seven of twenty-five universities used specific programmes. For international delivery of distance education, twenty of twenty-three universities used the same quality assurance programmes as those for Australian distance education and three had specific programmes.

Australia’s Review of Higher Education Financing and Policy (1998:59–61) discussed the absence of face-to-face teaching under the heading ‘Technology will revolutionise higher education teaching’ and noted that ‘many of the academics and students the Committee met stressed the educational importance of placing learning within the academic community, and of the dialogue between teacher and student, and between student and student’. It acknowledged ‘the fears felt by some in the academic community that the new technologies may reduce opportunities for human interaction and in this way reduce the quality of teaching’. It also noted that face-to-face teaching does not always live up to its ideal image and was convinced that ‘technologies offer significant opportunities to higher education institutions to enhance the quality, accessibility and cost-effectiveness of higher education teaching and research’ (ibid.).

The Higher Education Quality Council in the United Kingdom dealt with the issue of quality in off-shore programmes in its Code of Practice for Overseas Collaborative Provision in Higher Education in 1996. The Code required that ‘Arrangements for the quality control of approved collaborative links should be explicit, comprehensive and documented in detail. They should be no less rigorous than the arrangements operating internally in the UK institution’. Its detailed provisions included:

- adequate monitoring, including regular visits by staff from the awarding institution;
• clear and properly supported administrative systems to provide reliable information to the awarding institution on the operation and management of collaborative programmes;
• external examining procedures in accordance with the requirements of the awarding institution;
• sufficient visits, in both directions, between the home and overseas institutions, by academic and administrative staff;
• use of reliable local representatives to oversee the arrangements on the ground;
• knowledge of, or involvement in, appointments procedures for local staff by the British institution;
• the availability of British staff for consultation between the partner institutions;
• complaints procedures and provision for student appeals to the awarding institution;
• proper student records;
• student assessment procedures comparable with those used internally.

The Quality Assurance Agency, successor to the Higher Education Quality Council, has issued a Consultation Draft on developing a quality assurance and standards framework for UK higher education. It proposes a single, comprehensive and generally applicable code of practice on all matters relating to the assurance of quality and standards including aspects such as distance learning, programme monitoring and review, student guidance, welfare and counselling and student appeals, complaints and grievance procedures.

Hong Kong has also introduced quality assurance mechanisms. Its Non-local Higher and Professional Education Ordinance has been framed to protect Hong Kong ‘consumers’ of non-local higher educational services against the marketing of substandard courses in Hong Kong. Courses, which involve the physical presence of the non-local institution or its agent in Hong Kong for lectures, tutorials or examinations, must go through a registration process. It is designed to ensure that courses offered in Hong Kong are offered by accredited institutions, that the courses offered are accredited in home countries and that they are the same as those offered in home countries, with the same range of elective subjects. Consistent with ‘one country, two systems’, courses from institutions in the People’s Republic of China are covered by the Ordinance.

**Content and form of curricula**

There is a link between international student programmes and internationalisation of the content and form of the curriculum.

Internationalisation of the student population leads to internationalisation
of research interests, which in turn leads to internationalisation of teaching. There is demand for international student exchanges on the part of Australian students. Where there is a large international student population, the professional responsibility of academic staff leads to internationalisation of the curriculum. Universities seeking a competitive export product ensure that the curriculum is international.

(Back, et al. 1997:47)

Curricula may incorporate international content, through case studies drawing on international examples, through assignments involving research from the Web and other international resources, through interviewing of international students or others from different ethnic backgrounds or through the development of course material in collaboration with international partners. Universities with off-shore partners may undertake international staff exchange and may share ideas and curriculum developments with partner institutions. Curricula may be further internationalised by including options for language studies as part of a degree programme, encouraging and supporting international fieldwork and study tours; and promoting study abroad programmes. New technologies may allow a virtual internationalisation of the form of the curriculum.

**Intellectual imperialism and globalisation of accreditation**

A number of authors on higher education see internationalisation and globalisation as different but dynamically linked concepts. Knight, for example, suggests:

Globalisation can be thought of as the catalyst while internationalisation is the response, albeit a response in a proactive way. The key element in the term internationalisation is the notion of between or among nations and cultural identities. A country’s unique history, indigenous culture(s), resources, priorities, etc., shape its response to and relationship with other countries. Thus national identity and culture is key to internationalisation. The homogenisation of culture is often cited as a critical concern or effect of globalisation; internationalisation, by respecting and perhaps even strengthening local, regional and national priorities and culture is therefore seen as a very different concept.

(Knight 1997:6)

The concept of globalisation of education can be explored through an analogy with the cinema. The British film producer Lord Puttnam was a partner with the Open University, the BBC and the British Council, in a proposed, though abortive, World Learning Network. This venture led to widespread speculation about the potential for convergence of global media networks and higher
education (Cunningham et al. 1998:62). Puttnam told the Los Angeles Times in August 1997 that he was keen to ‘thwart any attempt by American entertainment conglomerates to establish the same sort of stranglehold over education and information that their movie divisions exert over worldwide distribution channels’. He argued that:

We’re now moving toward an information and education age in which the values and skills of entertainment are destined to affect and infect other areas of the economy. If we end up going down the same road in those two critical sectors that we’ve gone in movies, the implications for the world’s economy, and even elements of the world’s stability, are serious.

(Los Angeles Times, 10 August 1997)

Globalisation of higher education involves a supranationalism that straddles national boundaries, ignoring cultural identity. Technology often goes hand in hand with globalisation, magnifying the threat. A concern emerging from globalisation is the potential for international accreditation systems. Increasing mobility of human capital, demands for mutual recognition and globalisation of higher education could pose threats to the accreditation of higher education by national systems. International accreditation systems themselves straddle national boundaries and may involve cultural imperialism.

In contrast with globalisation, internationalisation of higher education recognises nations and describes a process of interchange of higher education between nations. It involves partnerships, between nations, between national systems, between accreditation systems, between institutions. Without partnerships, there is no international education.

**Access to borderless education**

There is at least the potential for excess capacity in many universities in the USA, Canada, Britain, Australia and New Zealand. At the same time there is substantial unmet demand for higher education from countries in Asia and Africa. Open and distance education and off-shore strategies are elements in the process of supplying higher education to satisfy demand and may help match supply and demand here. New technologies have the potential to reduce the costs of delivery.

This is not to say that the economics are easy. The World Bank’s Etienne Baranshamaje explained the costing structure of the African Virtual University project to Cunningham et al. (1998:87):

Our mission is that it has to be affordable to the African income. We’re counting on economies of scale to make that possible.... But it’s a lot
cheaper being done by the World Bank for the whole of Africa, but it wouldn’t make sense for an individual in one country to undertake such a project... The most costly aspects are not the equipment on the ground, but the content and the development. Being multinational, multidisciplinary, multi-language and multi-country has a cost, but it’s a worthwhile one from my perspective.

We have the possibility of a new learning architecture. Do new technologies, with their potential to reduce the costs of delivery, allow widespread borderless access, through partnerships, to an internationalised, quality higher education system such as Australia’s, with its long tradition of education across vast distances? The Commonwealth of Learning (http://www.col.org) has a vision of this:

Distance education is now a part of the mainstream of education and training. It enables students to learn at the location, time and pace of their choice, for far less money and with far greater results. COL’s goals include maximising the transfer of information, ideas, innovations and resources to support this rapid evolution of distance educational training.

Dhanarajan’s (1998a:11–12) views of the future are pertinent:

Partnerships, especially with institutions located in those parts of the world where the demand for learning will far exceed the ability to supply, will be particularly helpful as nations begin to accelerate the agenda for greater equality of opportunity.

The 21st century will witness, I am certain, the emergence of a number of pan-global open learning systems. They do not necessarily have to be funded by the public purse, but by entrepreneurs who will work in partnerships with either like-minded individuals or public-funded institutions which will not impede the movement of students, courses, learning materials, credits and staff....

Partnerships of the 21st century cannot be about territorial preservation (cyberspace does not recognise this), it will be about student volume and economics, learner choice and autonomies, mobility of jobs and people, explosion of knowledge and technology and interdependency and universalisation.

References


Web sites
Commonwealth of Learning: http://www.col.org
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Chapter 3

The impact of telecommunications

Robin Mason

Electronic communication by written message, by audio interaction and by video exchange comprises the field of educational telecommunications. The technologies which correspond to these different means of communication vary considerably, and as they are currently the focus of intense research and development, they are always changing.

There are three broad categories within which current technologies that support distance education can be divided:

1. text-based systems, including electronic mail, computer conferencing, real-time chat systems, fax, and many uses of the Web;
2. audio-based systems such as audioconferencing and audiographics, and audio on the Web;
3. video-based systems such as videoconferencing, one way and two way, video on the Internet with products like CUSeeMe, Web-casting and other visual media such as video clips on the Web.

The implication of this list is that text, audio and video are discrete media. While this is partially true today, the evolution of all these systems is towards integration—of real-time and asynchronous access, of resource material and communication, of text and video: in short, of writing, speaking and seeing. The fourth category and the best illustration of this convergence is:

4. the Web, which integrates text, audio and video, both as pre-prepared clips and as live interactive systems, both real time and stored to be accessed later, and furthermore which provides text-based interaction as well as access to educational resources of unprecedented magnitude.

Pedagogical advantages of telecommunications

It is no coincidence that the use of telecommunications media in education is growing at the same time as education budgets are decreasing.
Nevertheless, the use of telecommunications media in distance education is not driven solely or even primarily by cost incentives. Each of the media described below allows institutions to provide more flexible and wide-ranging access to their courses, and possibly to increase student numbers without the usual increase in costs. Educational reasons are more significant than costs, and image is often most important. In many areas of the curriculum, practical knowledge and experience with on-line communication is becoming de rigueur.

**Text-based systems**

Without doubt the most commonly used telecommunications technology for communicating with students at a distance is electronic mail and various forms of written group communication. Text-based interaction, whether many-to-many in conferences, or one-to-one in electronic mail, is practised at most institutions of higher education in developed countries, whether students are geographically remote, or actually on-campus.

Some institutions use standard electronic mail systems (which include the facility for sending messages to a group) to communicate with students at a distance. Those accessing from abroad usually use the Internet; those living locally may use a modem over telephone lines. The primary use is for students to ask questions of the tutor, but an additional use is the electronic submission of assignments, as an attachment to a mail message. This is the simplest and most accessible of all the telecommunications technologies, with the possible exception of fax.

More commonly in distance education, a proprietary computer conferencing system is used. FirstClass is a very successful product among educators, and Lotus Notes is common particularly in Business Schools and in training organisations. Web bulletin boards are also becoming very popular and most of the proprietary systems have integrated with the Web, so that conferences can be accessed from a Web browser. Computer conferencing systems allow students on one course to share discussion areas, to have subconferences for small groups, and to have easy access to all the course messages throughout the length of the course. Computer conferencing systems are slightly more complex than e-mail, and they may require the student to have client software. A faster modem may be necessary as well, or at least highly desirable.

The fax is most often used in distance education for sending and receiving students’ assignments. For example, the Open University in the United Kingdom provides a fax machine to those of its UK-based tutors who have students in continental Europe.

Text-based systems can be divided according to whether they are primarily synchronous or asynchronous in use. More accurately, while the technologies usually support both, in practice one or the other is the primary intended use,
and this influences the design of the interaction features. Figure 3.1 shows a screen from the FirstClass conferencing system in which messages are listed as separate items and comments on messages are apparent from the subject descriptors. While FirstClass includes a real-time chat facility and some educational uses are made of it, the most significant applications of the system are asynchronous.

Most text-based communication systems are used primarily to support students (with the contents of the course delivered through some other medium); however, some educators run ‘on-line courses’ in which the primary content of the course is the discussions and activities taking place among the students. For example, Applications of Information Technology in Open and Distance Education, part of the Master’s degree offered by the Institute of Educational Technology at the Open University, is run almost entirely on the Web through collaborative work, readings, discussions and electronic assignments.

One of the major advantages of text-based media is that they facilitate interaction for those using their second language. Most people are more able to write than to speak in another language. Furthermore, asynchronous systems allow time for reading messages slowly and composing a response with the aid of a dictionary. Not surprisingly, there is a range of very successful asynchronous text-based programmes at an international level for second-language teaching. Usually they provide natural language practice with
mother-tongue speakers, which is much more engaging and profitable educationally than artificial classroom practice.

Another primary advantage of any text-based system for **distance education** is that many people worldwide can access them using a personal computer and telephone line from their home. In fact, although there are a few uses of real-time chat or even computer conferencing in which students go to a study centre, campus computer room or training centre, most uses of these systems are asynchronous and from the student’s own machine (whether at home or in the workplace).

My third advantage of text-based systems is rather more contentious. Much has been made of the equalising effects of textual communication—the concentration on what is said rather than who says it. While it remains the case that the disabled and the disadvantaged can participate without the usual judgemental reactions, text-based systems do not remove bias and advantage; they merely shift it around a bit. Clearly, those who have regular access (for example, from both work and home) or have no concern about the cost of access, are advantaged in terms of being able to participate in discussions more easily than those who have restricted access and cost considerations. Furthermore, those who have good writing skills tend to dominate by the very quality of their messages, in that less literate participants defer to them or are simply deterred from putting in messages themselves. Finally, the openness of these systems to anyone, anytime to make their opinion known, to respond to other viewpoints and to engage in dialogue, is true in theory, but in reality, messages not following the main thrust of the discussion (keeping up with the ongoing conversation) tend to be ignored. Abuses of the openness of the system, such as ‘flaming’ (a jargon term to describe the all-too-common phenomenon of sudden heated confrontations between on-line participants often over misunderstandings due to textual communication), sexual harassment (also a common occurrence in on-line systems), and unsociable behaviour generally, have driven participants away and somewhat damaged both the image and the value of text-based communication (although this is much less prevalent in educational than social uses). So what was originally hailed as a new democratising medium, inherently more open than other modes of communication, has been shown in practice over time to be as flawed as the human beings who use it. Nevertheless, for some groups of people, text-based interaction allows access to **education** in a form ideally suited to their situation.

**Audio systems**

Straight audioconferencing using ordinary telephone lines is a low-tech solution to supporting students in the developed world, owing to the near ubiquity of the telephone in these countries. Many print-based **distance education** programmes use audioconferencing to help motivate students, and
it has also been used for small group collaborative work at postgraduate level (Burge and Roberts 1993). Nevertheless, there are relatively few uses of this technology in group-discussion mode (as opposed to simple student-to-tutor telephone calls) in distance education.

An extension of pure voice interaction is audiographics: voice plus a shared screen for drawing or sharing pre-prepared graphics. This technology has had more extensive use in distance education (Idrus 1992; Nordin 1992), and examples of it being used between sites in different countries also exist (Mason 1994b). As with audioconferencing, audiographics use with more than two sites requires an audio bridge to connect all the lines together. There is no technical barrier to doing this internationally; cost is the primary deterrent. The term ‘audiographics’ is used less and less now that shared screen and multiway audio are possible on the Internet.

Audio on the Web is a developing technology which many institutions are beginning to take seriously as an educational tool, especially when combined with various forms of real-time, text-based interaction. RealAudio, for example, is a product which allows real-time lectures with ‘overheads’ on a shared screen (http://www.realaudio.com/). Many distance education systems have involved sending audio cassettes out to students through the post. With audio on Internet products like RealAudio, it is possible for large numbers of students to access these ‘broadcasts’ in both real and delayed time.

Figure 3.2 is a screen from the Open University’s use of RealAudio to
deliver a global lecture and discussion session with a series of experts. The interface which has been developed on the Web to support the events, called the KMi Stadium, provides facilities for slides associated with the lecture (http://kmi.open.ac.uk/stadium/).

Before leaving audio systems, it is worth highlighting another up-and-coming technology: voicemail. Currently, this technology is being used by both distance teaching and campus-based institutions for mini-lectures, timely comments from the lecturer and for various types of assignments requiring a student response. The student dials into a special number and can listen to the pre-prepared message from the tutor. It is another low-tech solution to adding interactivity and responsiveness to the learning environment.

**Video systems**

Some educators feel that videoconferencing is not necessary in supporting students at a distance, and that audio, especially audiostreaming, works better because it concentrates attention on content rather than distracting the learners’ attention with the visual image of the speaker. For them, the significantly higher cost of providing video is not justified by the educational benefits. Others feel that we live in a visual age in which it makes no sense to restrict the learner to audio exchange. Video, when well used, contributes to the motivation of the student, makes the learning environment more social, and facilitates the delivery of exceptional learning materials in almost every area of the curriculum (see Mason 1994a).

One-way video (with two-way audio) systems have widespread application in North American distance education and some of these systems use satellite delivery to extend coverage. The National Technological University (NTU) is one of the best known and successful examples of this teaching method. Two-way videoconferencing is taking over from the one-way systems, and a number of multi-site applications are in use, for example, in Australia (Latchem, *et al.* 1994).

Despite the popularity of videoconferencing, there are many educational technologists who disparage its use. The following is a particularly incisive critique:

The widely held view that face-to-face teaching is inherently superior to other forms of teaching has spawned a major industry worldwide. It is difficult to believe that videoconferencing would have become such a major influence, especially in North America, without the intellectual complacency associated with the tyranny of proximity. The investment in videoconferencing has been quite staggering despite the widely held view that the lecture is a process whereby the notes of the lecturer are transmitted to the notes of the student, without passing through the minds of either....
The apparently unwavering enthusiasm for the proliferation of videoconferencing systems for the purpose of enhancing teaching and learning represents ‘the tyranny of futility’. If most lectures are relatively futile from a pedagogical perspective, why spend vast sums of money promoting expensive futile exercises?

(Taylor and Swannell 1997)

Streaming video on the Internet, however, is a developing technology which may have more lasting potential, precisely because it is more closely tied to the model of personal computing, just-in-time learning and Web-based resources, than it is to the notion of teaching and learning through traditional lectures. While technically feasible today, video on the Web is restricted by the bandwidth available to most distance learners. In theory it allows the image to be downloaded by remote sites in real time. More realistic today is the use of video clips integrated with text-based material, to illustrate and highlight rather than to deliver large amounts of live lecturing.

The Web

There is little doubt that the Web is the most phenomenally successful educational tool to have appeared in a long time. Evidence for such a statement can be found in Collis (1996) and Khan (1997). It combines all the media described above: text, text-based interaction, audio and video as clips and, with somewhat less robustness, multi-way interactive audio and video. Its application in distance education is unquestioned. Although access to the Internet is hardly universal, and large segments of the global population are more remote from access to it than they are to print and post-based systems of distance education, nevertheless, vast numbers of people worldwide do have access, many from their home, and this access is growing exponentially.

The Web is merely a collection of protocols and standards which define access to information on the Internet. The three defining characteristics of the Web are:

- the use of URLs (Universal Resource Locators) which provide the addressing system;
- the HTTP standard (Hypertext Transfer Protocol) by which the delivery of requested information is transacted;
- the development of HTML (Hypertext Markup Language) through which links between documents and parts of documents are made.

Fundamental to the nature of the Web is its client-server architecture, whereby the client (Web software residing on the user’s machine) requests a particular document from a Web server (a program running on a computer whose purpose is to serve documents to other computers upon request).
Having transmitted the documents, the server then terminates the connection. This procedure allows servers to handle many thousands of requests per day. One of the mechanisms for implementing audio and video on the Internet is through the programming language called Java and the HotJava browser:

HotJava interprets embedded application <APP> tags by downloading and executing the specified program within the WWW environment. The specified program can be an interactive game, animation or sound files, or any other interactive program. Also, when a file or application requires particular viewers, such as for video, Java anticipates this and calls these viewers up automatically.

(Collis 1996: Interface 3)

Now that it is possible to download programs from the Web along with data, and to receive the appropriate software to handle the program automatically, the institution wanting to deliver course material can manage the maintenance and updating of any software required for the course. The student no longer needs to struggle with the installation of massive packages, and, furthermore, can use a relatively low cost machine—even a portable.

**Synchronous versus asynchronous distance education**

As is apparent in this description of different technologies for delivering education at a distance, some of the systems rely on real-time interaction, while others can be accessed asynchronously. This difference has major implications for the design and delivery of distance education, as well as for the study requirements of the learner. There are advantages to both forms and in the end, personal learning styles and the larger educational context determine what is most appropriate. We can examine the major benefits of each mode in an educational context.

**Asynchronous delivery**

There are four crucial advantages to the asynchronous media and I have arranged them in descending order of significance:

- flexibility—access to the teaching material (e.g. on the Web, or computer conference discussions) can take place at any time (twenty-four hours of the day, seven days a week) and from many locations (e.g. oil rigs);
- time to reflect—rather than having to react on one’s feet, asynchronous systems allow the learner time to mull over ideas, check references, refer
back to previous messages and take any amount of time to prepare a comment;
• situated learning—because the technology allows access from home and work, the learner can easily integrate the ideas being discussed on the course with the working environment, or access resources on the Internet as required on the job;
• cost-effective technology—text-based asynchronous systems require little bandwidth and low end computers to operate, thus access, particularly global access, is more equitable.

**Synchronous delivery**

There are four equally compelling advantages to synchronous systems, although I am less confident of general agreement about the order:

• motivation—synchronous systems focus the energy of the group, providing motivation to distance learners to keep up with their peers and continue with their studies;
• telepresence—real-time interaction, with its opportunity to convey tone and nuance, helps to develop group cohesion and the sense of being part of a learning community;
• good feedback—synchronous systems provide quick feedback on ideas and support consensus and decision-making in group activities, both of which enliven distance education;
• pacing—synchronous events encourage students to keep up-to-date with the course and provide a discipline to learning which helps people to prioritise their studies.

**Implications for students, teachers and organisations**

In general, conferencing technologies should be tools to help human activities. But like models of teaching, they are not neutral tools. Their use will reflect whatever values the educator holds—consciously or subconsciously—about her/his relationship with learners, and their use will invariably bring advantages and disadvantages.

(Burge and Roberts 1993:35)

The context in which any of these technologies is used reflects attitudes to education on the part of the organisation and the particular teacher. This context defines the advantages and disadvantages for all concerned. What telecommunications technologies have in common is that students are not in the same location as the teacher and/or other students, at least not during use of the medium. This fact has a number of implications—for equipment
provision, learning styles, preparation of teaching material, and not least, training and support.

**Implications for students**

Most evaluation studies on educational uses of conferencing include feedback from students regarding their reactions to learning from the medium. Almost invariably reports are enthusiastic. Students are usually positive about the advantages the medium has brought them—a wider curriculum choice, less time and money spent travelling, more interactivity with the teacher and their peers. Where reports are less favourable, these are from quasi-laboratory studies in which students are put into both remote classrooms and face-to-face teaching situations and the results of tests compared. The fact is that with a few exceptions, these systems are used to meet specific needs such as time, **distance** and interaction. When these systems are used outside of any context of need, the results not surprisingly show less user acceptance.

How well do these systems meet students’ needs? The travel time and **distance** needs are best met by home-based technologies, or workplace settings. In some **distance education** systems, the study centre provides access to equipment and to a very convivial setting with a long cultural tradition. The social and interactive needs of students vary considerably—some students prefer to learn in isolation; others want some contact with their peers. Face-to-face contact is the only satisfactory form of interaction for some students; others find the curiously intimate but anonymous quality of computer conferencing contact very appealing. Undoubtedly videoconferencing is most satisfactory to most students in meeting social and interactive learning needs. Home-based access is likely to increase costs to students for the initial purchase of computer equipment and the ongoing cost of telephone calls. Training, maintenance and upgrading of the equipment are additional problems with costs attached.

Computer conferencing is the medium which most challenges the traditional lecture format. In fact, computer conferencing requires much more self-direction, motivation and initiative on the part of the student than do most other media. Although applications in this area are also growing very fast, the overall student acceptance level is probably lowest. Computer conferencing is hard work for students, much more so than listening to a lecture. There are not many precedents for interactive discussion in **education**—discussions in which one is expected to formulate a point of view, express it and modify or defend it in the face of comment or criticism. Many teachers cannot or choose not to use interactive teaching methods. Any experience students have had in doing this is almost invariably spoken rather than written. Although many students are very enthusiastic about computer conferencing, there is no doubt that many others are not. Most
tutors report that their main difficulty lies in encouraging students to participate.

Some students are very nervous about making presentations via videoconferencing. Having to manage equipment and being seen on monitors simply add to the general level of stress in presenting their own work. Asynchronous presentations through Web pages and on computer conferences cause less concern, as there is no camera to record embarrassment and nervousness.

The impact of these technologies on students varies with how active and interactive they choose to be. Students who want to take the initiative in the learning process and who enjoy engaging with their peers are empowered by these technologies. Others will use them to learn this independence and interdependence. Nevertheless, there will always remain a minority resistant to these technologies, for whom face-to-face is the only satisfactory learning mode.

**Implications for teachers**

Most reports about technology-mediated teaching indicate that preparation time is much greater than for equivalent face-to-face teaching. This preparation is of two sorts: producing material (for the Web or to illustrate a lecture) and planning the format of the course. The more interaction desired, the more planning is necessary.

The quality of the visuals used is a significant element in the success of videoconferencing. The size and legibility of the lettering and drawings, the production of graphics or other images require that the teacher be competent in the use of graphics software or have access to a support team. Sequencing the images to be used requires planning at the story-board level of detail—what course concepts will be conveyed with each image and how to make one flow into the next to create a meaningful narrative. One set of guidelines suggests:

- Questions to learners participating at distant sites should be preplanned and range from low-order (recall of knowledge) to higher-order (synthesis, analysis, problem solving etc.) on Bloom’s taxonomy of cognitive questions. The teleteacher needs to ask a lot of questions in order to ‘force’ interaction with the learners. After posing a question, the teacher should allow sufficient ‘wait’ time for students to process information before they answer.

  (Barker and Goodwin 1992:15)

With videoconferencing, teachers need to project themselves, rather like actors, and create a dynamic presence to convey their subject over a monitor.

The role of the computer conferencing teacher is the farthest removed
from that of the traditional lecturer. Course design is equally as important as with the other technologies and preparation entails the structuring of conferences and topics, and the design of activities and small group work. During the course, however, the teacher’s role is definitely one of facilitator and host, rather than one of content provider and star of the show.

The facilitator needs to pay careful attention to welcoming each student to the electronic course, and reinforcing early attempts to communicate. In the first few weeks, I make sure that my notes in the conference specifically reference prior student notes. I send many individual messages to students commenting on their contribution, suggesting links to other students, suggesting resources, and generally reaching out to students. The coaching function is key to easing the students’ transition to computer-mediated communication.

(Davie 1989:82)

While the teacher’s role is particularly time consuming in the initial phase of a computer conferencing course, it usually reduces as students take over the discussions. Nevertheless, some reports indicate that teachers spend up to twice as long, overall, to give a course via computer conferencing as they do to give a course by traditional means.

Most teachers who take on the challenge of teleconferencing, particularly those who develop collaborative learning strategies for their courses, report tremendous satisfaction, despite the greater effort required. The reward lies in their sense of working towards the goal of developing independent, questioning learners. Almost all find that using these technologies is a tremendous learning experience for themselves:

These experiences also taught me how to teach differently than in a traditional classroom. They have led me to reflect on my role as a teacher, and have enabled me to change my teaching style to facilitate learner-centred instructional systems that promote knowledge generation through collaborative learning. The quality of student interactions and performance has shown that students were able to generate knowledge, to innovate, to collaborate, and to analyze their own learning. The teacher’s role in interactive telecommunication teaching is best portrayed as that of a facilitator guiding and supporting the learning process. This is no easy task, and consumes much more time and energy than does teaching a traditional class. The role changes I have experienced as a result of distance teaching have been transferred to my traditional teaching in that my teaching style has become learner centered and interactive.

(Gunawardena 1992:70)
Implications for organisations

A number of case studies and evaluations of telecommunications applications underline the importance of top-level administrative support to the success of any programme. Although many small-scale uses of these technologies begin at grassroots level, with a few enthusiastic teachers, their growth within an organisation must have backing at the highest levels, because so many major policy issues are at stake involving, among others, questions about student support and about costs.

Support

The provision of support for students is a major issue an organisation must address. The quality of support services is equally as important to student motivation and performance as are the teleconferences. The organisation must consider the preparation and delivery of training materials to students. Many institutions offer their distance students telephone office hours for direct queries with their teacher. Individualised feedback from faculty on assessments and access to library resources (increasingly via electronic communications) are other forms of support. Operating a help desk for queries about equipment and communications systems is another institutional consideration for those involved in computer conferencing. Given the technical complications of the current telecommunications scene, many organisations adopt the policy of expecting students to turn to their local dealer for this support. Managing and supporting the equipment through its lifetime is another issue which some institutions face for the first time with telecommunications. For some organisations, a whole new unit and type of staff are necessary. Many underestimate the extent of this element of telecommunications.

To Understate the dollars required to operate, maintain, upgrade, and train the system is to undercut its assimilation into the instructional process. When this happens, technology remains supplemental, making it even more vulnerable to cost reductions.

(Maloy and Perry 1991:45)

Cost savings

Cost studies of actual uses of these technologies are very rare (Bates 1995). Generalisations from the few which exist are notoriously difficult to apply to other contexts. Examples of the introduction of technology reducing unit costs are most easily found in industry, where training by videoconference in the workplace replaces expensive face-to-face residential sessions (see for example, Lange 1994). Examples of unit cost reductions within education are much harder to find. This is partly because the introduction of technology
slowly changes the whole cost structure of course preparation, presentation and support. It then becomes difficult to compare before and after costs as they are literally no longer comparable: different staff are required and different kinds of students take the courses. However, more often the technology is an added cost, either because old systems exist in parallel, or because technology enriches but does not actually replace old systems.

Many practitioners have concluded that telecommunications systems do not save money in the long run. What they do is extend access to courses, improve the quality of current provision and meet needs which cannot otherwise be accommodated. Even this statement needs qualification, however, because in some respects the introduction of technology limits access and disempowers the technologically illiterate, the impoverished and those remote from networks. The most comprehensive study of this very complex issue is Rumble (1997).

One of the pitfalls of many attempts to reduce costs in education is to turn to information and communications technology as the cost saviour, and to assume that what is delivered in one medium (e.g. face-to-face lectures) can be transferred to another medium (e.g. videoconferencing, the Web) with minimal cost. However, the effectiveness of any medium is invariably dependent on exploiting the unique characteristics of that medium. Web courses need to be tailor-made for the hypertext structure; videoconferencing should exploit the two-way interactive facilities and the visual potential of the medium; computer conferencing courses need to build on the possibilities of collaborative group work, and so on. Consequently, technology-mediated courses are often cost-effective, but at the expense of educational quality. An alternative pitfall is to use the technology as an add-on to the course, thereby improving the quality, but increasing the cost.

New technology is usually employed to add richness or accessibility to otherwise unaltered programs; thus it tends to increase costs rather than lower them. If staff are able to save money in one area, they generally do not reduce prices and may not even be able to do so; instead the money is reallocated to other pressing needs within the same program.

(Ehrmann 1996:126)

Ehrmann concludes from his study that it is easier to achieve lower costs while maintaining quality and openness if the programme is created from the start to address this triple challenge. He describes these three interdependent elements as the quality of the learning process, the accessibility of the course, and the costs, both to the providing institution and to the student (Ehrmann 1996:11). Costs of open and distance learning cannot be assessed without also considering the quality and accessibility of any programme.
Consortia are a growing solution to sharing the high costs of videoconferencing, or the teaching and expert resources of a range of educational institutions. An emerging example of a consortium is the Western Governors University in the United States which has formed from existing institutions in order to address the need for accessible, relevant lifelong learning. It acts both as broker and as course provider. The University of the Highlands and Islands is a United Kingdom version springing from a similar vision.

Another resource-sharing solution to high costs is the joint use of study centres. In some places these are called tele-cottages, in which various kinds of teaching media are at the disposal of the local community. As competition among educational providers increases, these tele-cottages will allow students to access courses from a variety of sources and will offer a wider market for niche courses.

**Conclusion**

Has technology-mediated distance education been oversold? Undoubtedly yes. Will technology-mediated distance education increase? Undoubtedly yes. This is the paradox of technology and of humanity’s perpetual attraction to the new and exciting. However, there are educational benefits to be gained from telecommunications technologies: wider access, greater flexibility, more engaging learning environments and better communication with other learners and teachers.

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While professional continuing education may have been comparatively slow to recognise the significance of open and distance learning, the number of distance and off-shore MBAs and similar credential courses now offered by universities, colleges and commercial training bodies indicates that professional workplace learning is changing rapidly. The context in which many professionals work is being transformed as information technologies and more particularly the PC and access to the Internet are giving more working professionals direct access to career upgrading and problem-solving information on a day-to-day or even an hour-to-hour basis. Reflective practice (Schön 1987) can now involve the keyboard in addition to and perhaps increasingly in place of the seminar. This chapter looks at some of the possibilities which are now emerging for professionals to guide and direct their own career-long learning.

The changing world of professional continuing education

When Schön (1987) wrote about ‘reflective practice’ he was concerned primarily with the need to establish the practicum as a basic element in the initial training of undergraduates in university professional schools. He quotes the dean of a maritime engineering school who recognised that he was teaching students how to build good ships but not which ships to build: there was a clear need for training to be placed in a context which would better enable graduate professionals to apply their specialist knowledge effectively.

Universities have tended to recognise two categories of graduate. Postgraduate describes those who remain in the system in order to proceed to higher degrees. A broader term for those moving on into careers, jobs and other post-university lifespans is alumni, which carries connotations of completion, celebration and in most cases a more or less tacit expectation of future financial contribution. But most of the contexts into which alumni, and indeed many postgraduates, pass after graduation have become
increasingly fluid. Job security, even for the highly skilled, is less certain and professionals must adapt to that workspan reality. While some relish the flexibility which peddling their specialist and highly portable skills offers in select competitive markets, most must work strategically and continuously to upgrade or redirect hard-earned entry skills in anticipation of several, quite possibly involuntary, career changes. In these circumstances, reflective practice attains a new measure of urgency.

Many universities have moved quite rapidly to acknowledge this change even though in the nature of universities they have tended to do so by offering new credentials such as graduate certificates and diplomas often drawn from the existing curriculum rather than starting by exploring the range of needs of the reflective practitioners themselves. In this they have often been guided appropriately enough by professional associations, employers of graduates and groups of employers. They have also been motivated by two other significant factors. In almost every university mission statement we now find specific commitment to develop lifelong learners: opinion may vary as to whether this means the development in undergraduates of skill to continue learning independently throughout their working lives without further assistance or whether it acknowledges that apprenticeship training of initial graduates from whatever faculty is no longer sufficient and must be supplemented. The other major motivator has been the capacity, long denied, for universities to charge students for postgraduate award study. An MBA, endorsed by employers, perhaps by an entire industry, becomes a worthwhile investment for a professional employee and also a worthwhile and profitable enterprise for a providing university. That is a win, win, win situation which of course explains both the prevalence of MBAs and their cost.

There is one other factor of particular relevance to the Commonwealth of Learning. At the time of COL’s foundation there was a rationale, more or less overt, which argued that if it had become too expensive for students from developing countries to go to study in developed countries then it was necessary to take the courses to the students at home. The very significant growth in undergraduate places in many Commonwealth member nations has now made this challenge somewhat less relevant at the first degree level. However, the widespread imposition of full fee charges for overseas graduates pursuing post-initial qualifications and updating courses has now made the original COL rationale one of particular significance for postgraduate and professional students for whom provision at home may well be sparse or non-existent.

**The university and recurrent education**

Many universities have longstanding and highly regarded extension programmes through which academics have been able to contribute to the community by offering courses of interest from their particular expertise on
a not-for-credit basis, and increasing recognition of the significance of lifelong learning means that this will remain a most important activity across a wide range of subject areas. However, more specialised contributions to continuing professional learning, often guided by the influence of that profession’s association or crediting body, have served three major categories of professional need:

1. further credentials: for graduates with a background in the subject area but requiring greater depth and sophistication;
2. updating: again for graduates with a background but whose major concern is to guard against the outdating of their original training;
3. changing direction: designed for graduates who want to add a new, possibly complementary, skill to their original training but who do not have that discipline background.

Strategies for meeting these needs have almost invariably focused on structured coursework, a medium with which most academics are familiar and which lends itself readily to organisational arrangements favouring economies of scale. However, the increasing availability of on-line resources makes it more possible, and perhaps more likely, that professionals will seek to direct their own upgrading and change of direction.

**University structure and lifelong learning**

The adoption by universities of a flagstaff commitment to the development of lifelong learners is raising consciousness that graduation is both more and less than completion of an apprenticeship. Professional schools will always have the spur (or in some cases perhaps the drag anchor) of a gatekeeping professional association, but there can be few faculties left in which either students or staff still see the initial BA/BSc as a ‘meal ticket’.

Universities have grown increasingly aware of the competitive nature of continuing professional education. In many countries it is no longer practicable for them to expect the community, its stakeholders and members, to come cap in hand to a seat of learning. There are other universities, some close at hand, some perhaps on the other side of the world, with ready marketing and organisational access to any supposedly local catchment area. There is ever-increasing readiness of graduates to look at other educational sectors for the technical and vocational knowledge and not to be hung up by artificial status considerations. In addition, there are now a significant number of providers of continuing professional education from the commercial sector, while several professional associations and many individual employers provide specialist in-house training for their professional staff geared to their own specifications.

Linked to, or underpinning, this competitive situation have been the radical
changes offered for teaching and learning practices through the new computer-based interactive and asynchronous technologies. Because practising professionals are almost by definition computer-literate and desktop-active in their daily working lives, the potential for applications in continuing professional education is boundless. The capacity of providers to exploit this potential will rest on a range of factors, including technical infrastructure capacity, the skills to use it effectively and the motivation of, and incentives provided for, those with control of the knowledge base.

Flexible teaching and learning and professional development

All stakeholders in higher and continuing education now accept the value of, or at least the necessity for, increasing flexibility in the provision of teaching and learning. But, as with most aspects of openness in education, interpretations of flexibility are as elastic as the term itself. Academic course structures are generally carefully constructed around the long-term aim of graduation as the outcome of years of cumulative study, and this mind-set does not adjust easily to the notions of customisation and fee for service which are of prime importance in professional development education. Knight (1997) uses somewhat cumbersome terminology in developing an important perspective on this issue when he distinguishes between short half-life knowledge (SHK) and long half-life knowledge (LHK). LHK is acquired over months or years in formal academic programmes: it is generally seen to deliver positive economic and social, as well as purely individual, benefits and is therefore a good candidate for public-sector finance and delivery and for presentation to cohorts of students across a standard academic year. SHK by contrast, can be acquired relatively quickly and often has a short useful life: it is likely to be practical vocational knowledge such as a new surgical technique or new computer software which, unless practised immediately after acquisition, is easily forgotten. By definition this learning on demand is ill-suited to the student-cohort structure and in contrast to long half-life knowledge, SHK is therefore ‘an excellent candidate for private sector provision and finance by individual members of the labour force or by companies’ (Knight 1997). At one time it might have been argued that universities had little if any place in the provision of SHK, but increased market awareness and the need to broaden funding sources has changed that perspective. At the same time, it is of course no accident that faculty groups most responsive to SHK learning needs are likely to come either from professional schools or those with well-established consultancy programmes in industry or government: these links provide both the opportunity and the legitimacy for adopting customisation as a core component of educational provision.

Most customised professional training programmes are offered as courses with varying degrees of flexibility for participants to determine their own
pace of study or to select from component parts of the material. By arrangement with employers, courses may be offered to groups at their workplaces or increasingly on-line.¹ But while public-funded universities are now comfortable in sharing curriculum design for an individual module or a non-credit course with an employer partner, most would baulk at the notion of a privately designed award curriculum to be delivered and accredited by the partner university. A current example of such a structure is one recently formalised between an Australian university (University of Technology, Sydney) and the country’s largest insurance company (AMP): it was significant that the commercial partner reported its difficulty in finding such a collaborating university because ‘most universities couldn’t even have the conversation’. Many universities have wrestled with this issue of private-sector patronage in relation to research funding with varying outcomes and some professional associations have long exercised influence in the universities’ development of curricula for training their prospective members: it is therefore interesting to consider how far they may go in extending this influence to the point of contracting out to a university the teaching of a specific set of professionally determined objectives. At what point is academic integrity compromised and is that point necessarily more elastic in professional faculties than in others?

The development of increasing numbers of on-line courses, modules and updating packages is opening up much broader access for individual professionals who may be self-employed or working in small partnerships without ready access to workplace group training programmes.² Courses and modules of courses meet a large proportion of the demand for professional development education, particularly where this is geared towards the earning of credentials or meeting employers’ expectations of recurrent updating of professional skills. This is the dominant sector of the fee-for-service market for professional education; it is relatively straightforward to organise, cost and implement and, even where customised, it lends itself readily to the development of profitable economies of scale. But it does not provide for the full range of need for professional development.

Reflective practice and personal professional development

Many professionals will continue to be involved in some formal credentialled learning at various stages or even throughout their careers. But all reflective practitioners will be more or less actively involved in self-directed informal learning on a day-by-day basis as they cope with the challenges of their job, and there is no particular reason to distinguish here between those in formal professions and any other workers who take an active reflective interest in their jobs. In times of rapid technological change, reflective practice is virtually an occupational necessity for everyone. Informal learning is widespread and
significant (Candy 1991; Gear, et al. 1994; Becher 1996) but has generally been regarded as irrelevant in higher education, because it is not readily translated into credentials: at best something for extension activity. It tends also to be submerged by employers as ‘not measurable for promotion or work release’ and even by the practitioners themselves who often see it as ‘just broadening my perspective’. But recent studies have demonstrated the significance of such activity. In a study conducted from the University of Hull, Gear et al. report examples of architects teaching themselves about computer graphics, stonework restoration and church-bell technology in order to enhance their capacity to cope with emergent job demands, engineers pursuing capital investment strategies and railway signalling, and lawyers studying alternative dispute resolution, book editing and library cataloguing. The list of learning needs is broad and diverse but not random: we find reflective practitioners seeking quite systematically to improve their professional skills in relevant ways, but also in diverse subject areas which formal postgraduate coursework awards could never hope to anticipate. Becher emphasises the importance to professionals of informal, often casual, interactions and consultations extending throughout their careers—commonroom discussion addressing specific task-related factors at the workplace. Reporting on a British study, Becher notes the marginal role of higher education institutions in meeting the continuing education needs of his professional subjects which ‘stems from their (universities’) tendency to regard formal courses as the most appropriate mode of teaching provision, while practitioners in general take a different view’ (Becher 1996:54). More optimistically, however, Becher reports that ‘universities were seen as valuable sources of specialised knowledge and as helpful in resolving technical problems’. This comment is highly significant when considering the changing role of universities because it focuses attention on the opportunity for academics to be consultants to individual professional learners in addition to, or in place of, their more familiar role as curriculum specialists in developing courses to accommodate established professional needs.

Is there a way in which higher education can exploit the rapidly increasing use of asynchronous computer-based teaching and learning interaction to benefit its advantageous position in the provision of specialist knowledge to reflective practitioners? In a report for the Association of European Universities, Edwards (1996) anticipates such a development when he speculates that ‘the university may well find itself becoming a sort of “learning broker”, in a situation where learning demands and learning resources must be matched’.
Learning brokerage and reflective practice

Because they have made a heavy investment in the development of courseware, universities are happy when they can enrol postgraduation learners in courses or in sets of units drawn from courses or in modules or sets of modules drawn from units. This modular structure is cost-effective, and where it also includes scope for customisation to accommodate the needs of corporate clients it will remain the staple of continuing professional education delivery. There is also a range of modules in print, on CD-ROM, and increasingly online, available for a fee and offering updating in dentistry, medicine, engineering and other professional areas for clients who are clear about their specific updating targets.

But there is another market. Because this market deals with the less well-defined but no less important learning needs of individuals, or of potential groups with similar interests, rather than with cohorts and classes, it is more difficult to operationalise and to cost. However, the rapid development of flexible-learning techniques and a focus on guided independent study both on- and off-campus offers increasing legitimacy to the role of learning broker. Most universities have a Guide to Academic Expertise, the major purpose of which has often been to provide the media with spokespersons on issues of the day. But what if this Guide became recognised as a systematic standard for reflective professional practitioners to the ‘specialised knowledge and assistance in resolving technical problems’ already identified by Becher as one of the university’s major strengths? (Becher 1996). A number of current projects developed at the University of Sheffield are exploiting the flexibility of asynchronous (and therefore reflective) computer conferencing to foster interprofessional interaction as ‘just in time open learning’ (McConnell and Hammond 1997). Meanwhile, at Stanford University a well-recognised capacity for using communications technologies for outreach into industrial worksites is being expanded by the introduction of ‘asynchronous access to the desktop’ (Harris and DiPaola 1996). Significantly, these authors report that:

the essential power of the emerging technology may be to provide sufficient flexibility so that...greater numbers of students can be approached as specific cases in a cost effective manner. Ultimately this customisation might reach the level of the individual student.

(Harris and DiPaola 1996)

Of course any such schemes which seek to involve academic staff as sources of specialist information for individual practitioners or as facilitators of computer-based discussion of professional issues will need to address at the outset vexed issues of recognition and reward for such inputs if they are to succeed.
One regularly expanding source for professional development education of all types is a university’s alumni. While most professional schools and teacher-training establishments have long recognised that their alumni are not just past graduates but ongoing professional colleagues this is not necessarily a dominant perspective in other areas where conferral of a degree can all too easily be seen by both parties as a termination. There are, however, commentators now arguing that the concept of graduation is outdated and becoming increasingly irrelevant and that degrees should indeed carry with them a type of maintenance contract of the sort familiar to purchasers of household appliances to provide a systematic and recognised basis for ongoing professional development.³

**Professional development education and the developing Commonwealth**

In all discussions of educational development, the question of disparity of access for people in countries at different stages of technological infrastructure development is pertinent. The widespread imposition of full-cost fees by the traditional provider nations has challenged COL and other facilitators to seek ways of taking professional education to students in their home countries rather than taking students to overseas-based courses. A significant example of how this challenge is being met is provided by the current development of a Commonwealth MBA and MPA using collaboration between existing distance education university providers to construct a high status programme which students in developing countries, or their sponsors, can afford.

It will be interesting to see whether this principle can be extended to meet the needs of a broader range of Commonwealth professionals. It can be assumed that ever-increasing numbers of such professional people will gain access to and competence in using computer-based educational resources in their workplaces. They are, however, all too likely to lack the financial resources to access on-line courseware, computer conferencing and asynchronous interaction with academic specialists, technical experts and fellow practitioners on any sort of regular basis. Perhaps it is time for a new Colombo Plan, one which this time provides a number of selected practising professionals in developing countries with a financial subsidy enabling them to participate in the rapidly growing networks of on-line reflective practitioners. In due course, these initial participants in Commonwealth-wide networks would be in a good position to act as catalysts for the development of local networks both on- and off-line, designed to give meaning to that critical and ever more challenging requirement so often used as a throwaway line at graduation ceremonies—‘make sure you keep in touch’.
Notes

1 Examples are customised training programmes offered in industrial contexts by the Open Learning Agency of British Columbia; and more specifically by Washington State University Engineering Faculty on the Boeing aircraft site. ‘On demand’ on-line courses and modules are available in corporate sites from the Stanford University Centre for Professional Development through ADEPT (Asynchronous DE Project).

2 For example, the University of Pennsylvania School of Veterinary Medicine CALL Updates programme.

3 See, for instance, the Open Learning Katholicke Universiteit Leuven, Belgium, Homepage: http://www.kuleuven.ac.be

References


In the last thirty years, distance education has moved from the margins to the mainstream of higher education policy and practice in many countries, accompanied by a spectacular growth in programmes, institutions and enrolments. Governments, in particular, increasingly see distance education as a valuable economic and social tool in meeting the demands of an information society. The methods and technologies surrounding distance teaching and learning have been systematised, so that those involved now take for granted the way things are done, just as educators in more conventional environments take for granted the way face-to-face, classroom teaching should occur. However, such is the speed of change nowadays that this status quo cannot last.

Throughout this expansion phase there has been an assumption that distance education and face-to-face teaching are different forms of education, each with its own value systems, organisational arrangements and teaching/learning systems. Although hard to sustain in practice, this has been largely due to distance educators’ search for legitimacy and status. The separateness has been reinforced by the organisational structures of distance education: on the one hand, open universities entirely dedicated to distance teaching; on the other, distinctive distance education department/centres within dual mode universities. The quest for legitimacy also sprang from the desire to distinguish distance education from its predecessor, correspondence study. We argue here that what is now occurring is far more than simply evolution of distance education into a third stage, as Nipper argued in 1989.

We suspect that the days of distance education, as such, are numbered. An unsteady, problematic, profound process of change is under way. Distance education methods and systems are converging with those of face-to-face teaching, strongly influenced by new electronic technologies. This process, we believe, will transform university teaching and learning as a whole, not merely add some distance teaching here, and some on-line technologies there. The watchwords today are flexibility, student-centredness (or client-centredness), networked learning, quality and efficiency. What might such a
transformed learning environment look like? We outline a concept of flexible
learning based on our experiences in Australia and Sweden, and use examples
from these countries to illustrate some of the major issues with which
universities are now engaging. They represent versions of the dual-mode model
which is by far the most common environment within which distance teaching
presently occurs.

**Triggers for a paradigm shift**

Broadly speaking, for advanced and developing nations alike, the triggers for
change in university teaching are declining funds, advancing technology and
the demography of students.

In most industrialised nations, the advent of the information society and
demand for educated professionals is, paradoxically, being accompanied by
a decline in public investment in education and greater emphasis on the
individual's responsibility to pay for education. In countries like Australia
and Britain, a typical first response to financial crisis was to increase class
sizes and academic workloads. When this overloaded the system unbearably,
the search intensified to find alternative ways of teaching which reduce unit
costs, satisfy academic criteria of quality and meet customer needs. In Sweden,
the government now requires universities to meet their obligations to serve
labour-market needs especially through distance education and professional
continuing education (Government of Sweden 1997). Students’ costs have
traditionally been met by the state, but government is now also encouraging
universities to pursue education contracts with employers, again through
distance education in particular.

Electronic technologies are triggering change in every area of work and
social life in the developed world. Universities are responding to an imperative
to adopt on-line technologies that will enable them to provide up-to-date
education and training, support larger enrolments, and remain competitive
in a global educational economy. In Sweden, for example, the elaborate
national communications technology infrastructure appears to offer a robust
solution to a decline in public investment in higher education while serving a
sophisticated technologically oriented economy and society.¹

The third trigger—the changing demography of students—is partly a
function of the shift from elite to mass higher education, and partly a
consequence of a growing demand for recurrent, lifelong education. Broadly
speaking, universities are educating far greater numbers of students, drawn
from more heterogeneous socio-economic, age and gender backgrounds, with
diverse prior educational experiences and levels of knowledge and skills, and
varied learning styles. Rigid times and places of formal teaching do not suit
the requirements of many potential learners who must juggle study with work
and family commitments and may be some distance from a campus.

These factors are triggering turbulence in universities. The physical,
intellectual and social boundaries around universities are loosening as they explore notions of real and virtual campuses, and seek greater flexibility in who, where, when, what and how they teach. A three-way convergence of **distance** and **face-to-face education** and electronic technologies may seem inevitable in these circumstances, but the reality is far from straightforward. A recent International Council for Distance Education (ICDE) taskforce identifies a formidable range of barriers to change: resistance to new learning theory and practice, rigidity of organisational structures, the tyranny of time, persistence of traditional faculty roles and rewards, assumptions about learning content, constraints of regulatory and accrediting practices, and traditional funding formulas (Hall et al. 1996). Australia’s National Council for Open and Distance Education, in producing quality guidelines for universities contemplating such moves, points to a similar set of inhibiting factors—ingrained conservatism among many staff and students who continue to favour traditional modes of instruction; academics’ insecurities about the nature and continued tenure of their positions; a distaste for standardised learning packages and/or a fear of technology; students’ difficulties in learning how to take responsibility for their own learning; and fears that flexible learning will be imposed on universities in the simplistic belief that it is a cheap solution to large-scale delivery (NCODE 1996).

**An emerging concept of flexible learning**

There may be widespread agreement that the paradigm shift is occurring, but the pace and characteristics of change vary considerably, and paradoxes abound. Even the terms employed exemplify the confusion. In North America, terms such as ‘distributed learning’, ‘technology mediated learning’ and ‘telematics’ are common. In Britain and Australia, the term ‘resource-based learning’ emphasises the resources and media for student-centred learning in a mass education context (NCODE 1996). It represents a partial response to political pressures to increase enrolments at lower cost. Another term—‘flexible delivery’—dominates Australian vocational education (TAFE 1993; OTFE 1996). It implies a narrow emphasis on one-way delivery of education and reflects also a political assumption that education is merely an industry delivering educational product.

In Sweden, continued use of the term ‘distance education’ when the actual environment is increasingly blended, is causing some confusion in public debate and resource allocation, but the term ‘flexible learning’ is rapidly penetrating public discourse. This term is gaining popularity elsewhere, too, especially in Australia where several universities have created flexible learning centres (at least one incorporating a former distance education centre).

Some consistency in trends is apparent across national borders, but has yet to be consolidated into a rigorous theoretical construct and coherent
practical framework for university teaching and learning. Our own experiences lead us to believe that piecemeal approaches to change are counter-productive, and that what is needed is comprehensive university-wide strategies, based on explicit integration of a well-articulated set of institutional values about learning, with a range of teaching strategies and technologies, plus a set of organisational systems and networks to support them. Distance education and face-to-face teaching disappear as separate constructs, to be replaced by flexible, networked learning. We define the ideal of flexible learning as approaches to teaching and learning which are learner-centred, free up the time, place and methods of learning and teaching, and use appropriate technologies in a networked environment.

As concept and practice, flexible learning draws qualities or experiences from its three parents. For example, it takes from distance education the idea that education should go to people and not the other way around, and harnesses extended experience in fostering student-centred learning. It builds on distance educators’ expertise in designing and producing learning materials, and choosing and using technologies appropriate to the learning purpose. And it also draws on experience in interinstitutional collaboration and networking to support learning. From campus-based education flexible learning draws a recognition of the importance of interaction and personal contact between teacher and learner (although distance education has shown that personal contact need not be face to face for effective, stimulating learning). Moreover, since learning is a social activity, greater flexibility and use of technologies have implications for campus learning spaces and facilities, and for the roles of networked study centres or virtual learning environments. The third element in the fusion is information technologies which can change dramatically the variety, amount, sources and media of information required in learning. Moreover, the communications capabilities of the new technologies have the potential to reduce significantly the old bogey of distance education—students’ isolation from each other and their teachers.

What, then, might a comprehensive approach to flexible learning mean for a dual-mode university? One example is that of Mid Sweden University, a young, multicampus, dual-mode institution of 14,000 students and 500 staff, located about 400 kilometres north of Stockholm. Its mission statement places the student at the centre of its activities and emphasises networking within the University and with its various regional and national communities and budding international connections. In 1998, Mid Sweden has accepted a definition of flexible learning as one which (MSU 1998):

- applies to teaching and learning wherever they occur—on-campus, off-campus and cross-campus;
- frees up the place, time, methods and pace of learning and teaching;
- is learner-centred rather than teacher-centred;
- seeks to help students become independent, lifelong learners;
changes the role of the teacher who becomes a mentor and facilitator of learning.

Implementation requires the integration of:

- teachers who have the skills in course design and teaching necessary to support student-centred, lifelong learning;
- students from diverse backgrounds, learning styles and motivations to study

to assist them to achieve their personal goals and the University’s goals for qualities of its graduates, through strategies such as:

Courses

- Entry arrangements which ensure greater access and equity for students from various backgrounds;
- degree and course plans which set out specific learning outcomes and generic graduate qualities, and the ways in which each will be achieved;
- course content which takes account of students’ backgrounds and recognises that we live in a global community.

Teaching and learning

- Use of learning materials and technologies which are appropriate to the subjects and needs of the students;
- teaching methods which free up the time, place, mode and pace of learning;
- information literacy and support programmes which assist students to become independent lifelong learners.

Organisational arrangements

- Teachers working in networked partnership with academic support specialists;
- organisational structures, planning and resource mechanisms which enable rapid, networked support to flexible learning;
- collaborative networks across the campuses and with outside bodies in order to free up modes of teaching and the range of courses available anywhere, any time.

Based on

- Evaluations of experience and practice in flexible learning;
research into the educational, social, technological and policy issues underpinning university teaching and learning in a rapidly changing environment.

Change of the magnitude planned by Mid Sweden University will not be easy or fast. We are sceptical of quick-fix technology based solutions. For Mid Sweden, this long-term transformation requires simultaneous attention to the University’s culture, the knowledge and skills of academics as teachers, the organisational and resource arrangements supporting learning and teaching, and its networks of relationships within the University and with Swedish and international communities. In 1998 it is a unique approach for a Swedish university, but several Australian universities are pursuing similar lines (for example, see Moran 1997). From our experiences in both countries, we have identified four of the major issues confronting dual-mode universities moving into flexible learning: the changing role of the teacher; learning materials production systems and infrastructure; mixing real and virtual campuses; and collaboration and networking.

Role of the academic teacher

As the learning paradigm changes, so do the teacher’s role and relationships with students, exchanging transmission models of teaching for constructivist, collaborative models of learning. Constructivism is not new, and good teaching has always emphasised deep learning through dialogue. However, the transmission model is easier when teaching large numbers or when academics have a limited repertoire of teaching skills. It is also an easier response to students who are reluctant to abandon their initial dependence on the teacher and seek autonomy as deep learners. It is now increasingly difficult to sustain this as a prime model of university teaching. In the teaching task, the role of information provider declines; that of mentor and collaborator in learning grows.

Commitment to student-centred learning has been common in distance and open learning for years, but there remains a tension between the desire for individualised learning, and the standardisation inherent in self-instructional learning packages delivered to large numbers. For the teacher also, there is a risk of alienation within a quasi-industrial educational system (Peters 1989), and a fear of losing authority in the learning environment; perhaps also of losing one’s job to encroaching technology. A gulf is opening between academics’ present levels of knowledge and skills as teachers, and those they increasingly require—not only in choosing and using technologies for course development, teaching and assessment, but also in curriculum development more broadly.

In response to these changes, staff development and training is beginning to assume a central place in university approaches to flexible learning and
technology adoption. In the United Kingdom, the Dearing Committee has recommended major investment in staff training and development by all universities, and a national (but voluntary) system of teacher accreditation under the aegis of a national Institute for Learning and Teaching in Higher Education (NCIHE 1997:8.56 ff.). In Australia there have been calls for staff development to be placed at the core of university activity in recognition of the vital link between institutional strategic development and individual professional development (AVCC 1995; Moran 1995; Stanley 1996).

Latchem, Lockwood and their collaborators (1998) outline the multiplicity of ways in which distance teaching universities, in particular, are addressing staff development needs. In distance education, broadly speaking, staff development has been a by-product of the emphasis on quality in course materials. In dual-mode systems, where the same staff teach courses on- and off-campus, these skills may well spill over from distance teaching into the classroom, but the strength of staff development support has resided in a pragmatic, technology focused orientation to course design and delivery. This is unlikely to be sufficient as the teacher’s role changes, and a more systematic, deeper and broader understanding of the nature of learning and teaching is required.

One major difficulty in responding to the need for staff development is the shortage of well-qualified, multi-skilled staff developers or instructional designers with backgrounds in both distance and classroom teaching and advanced understanding of a technologically mediated learning environment. The role and skills base of this position do not easily fit traditional characteristics of academic work and are often misunderstood when it comes to salary levels and tenure. Status and career paths are often unclear and may not encourage people into the area. One solution is to maximise the ability of centralised expertise to support academics by creating networks of departmental academics who become the local flexible learning guide and mentor to their colleagues. This solution has the added advantage of helping academics to construct their own knowledge and skills as teachers.

There are signs that this and other factors are influencing new models of staff development and instructional design support are emerging to support flexible learning. At Mid Sweden University, for example, a project was begun in 1996 (and is now being mainstreamed) called the Växthus, or Greenhouse, whose goal is to nurture the flowering of interest and expertise in flexible learning within each department (Myringer 1996). This small central group provides just-in-time specialist services to a Flexible Learning Network comprising a member of each academic department. At least 10 per cent of the academic’s teaching load may be assigned to their participation in the Network and support to their departmental colleagues. The Network is intended to stimulate interdepartmental and cross-campus communication and sharing of expertise and experience.

In Australia, there is a trend towards integration or transformation of
the former roles of distance education centres and academic development units, the goal being ‘one-stop academic and technology support services for all modes of teaching and learning’ (Latchem and Moran 1998). Their work is driven by priorities set by the increasingly explicit strategic plans of universities for teaching and learning, technology implementation and internationalisation.

Learning materials production

The single-mode open universities pioneered elaborate in-house centres and processes for production of learning packages, predominantly print materials. In Australia’s dual-mode system, cadres of instructional designers and specialist production staff, working on course materials, took priority over the student support functions which many distance education centres also carried. While the model may continue to be valid and cost-effective for the mega open universities, it is losing strength in dual-mode universities, especially where financial constraints are biting. The model has rarely applied in the erstwhile conventional universities. We predict that flexible learning/distance education units in future will be concerned primarily with educational design support, project management, quality control and student support, but not with materials production as such.

There are three reasons. One is a renewed battle for centralised versus decentralised control. Most of us are familiar with complaints that the distance education centre receives resources which should go to the real educators who should control what is done with them; and the impatience of the ‘gungho’ enthusiast who is way ahead of the more cumbersome and bureaucratically inclined central department. The second reason is closely related—the intimate relationship between the technologies being employed and the kind of production systems and expertise needed to make and deliver learning materials. Production of electronic materials does not involve the same kind of linear production processes which print materials have required. The availability of educational software packages and in-house templates arguably reduces the number and type of specialist production personnel one needs to support the academic author.

Third, there is a trend—borrowed from industry—to emphasise core business and to outsource other tasks in the interests of cost-efficiency and rapid response to changing demands. Publishing and multimedia production require heavy investments in facilities, equipment and specialist staff which do not sit well with universities honing their core business to teaching, research and community service. In contrast, the rapidly burgeoning multimedia industry offers sources of expertise and facilities which can be accessed on demand, at competitive prices, to nominated quality. In these circumstances, core business for a flexible learning centre is helping academics to become more expert, innovative and flexible in curriculum design and delivery;
supporting students in various ways, especially in networked and virtual environments; and pulling together the special management and quality control facets of flexible learning.

It may well be easier for universities without an established in-house production infrastructure to implement more streamlined systems to cater for flexible learning on- and off-campus. Swedish university distance education, for example, has typically taken a do-it-yourself approach to distance education rather than the industrial model typical of open universities and many of the larger dual-mode systems. That is, the individual academic has been responsible for development and production of learning materials and Swedish universities have not built up either instructional design or materials production specialist centres (Brändström 1992).

This craft approach has had disadvantages of cost inefficiencies, inconsistent quality in learning materials and teaching processes, and lack of access to specialist support services. However, the craft tradition leaves two important advantages. First, many staff have experimented with various aspects of flexible learning and using learning technologies, and so already have expertise to offer the in-house Flexible Learning Network (see above). Second, the university is not constrained by pre-existing costly infrastructures of materials production, nor by heavy reliance on one technology (notably print), so is able to choose rapid response strategies based on on-line technologies which suit the external environment. It can hire in production expertise just in time—with an added benefit of helping to support a small, but growing, local multimedia industry.

In Australia, two trends are becoming evident. One, exemplified by conventional universities embarking on flexible learning, is to re-form academic development units into flexible learning centres and provide advisory services for learning materials production. Progress may be hampered by the shortage of well-qualified staff and the need for existing developers to expand their knowledge and skills to accommodate to the new learning paradigm. Most of the major distance teaching universities, on the other hand, are embarking on major changes to their distance education centres ranging from disbandment and dispersal into faculties, to down-sizing of technical production facilities and personnel, to redefinition of the roles of instructional designer and editor. They may encounter problems of lack of staff developers with expertise in individual performance of teachers. Instead of viewing a distance education programme holistically in terms of scheduling and costing, there is a trend towards treating courses or groups of courses as projects for which the distance education centre provides an integrated set of services, including management of the relationship with external multimedia services providers.

These trends pose particular problems for the single-mode open university, at least in advanced countries, where the entire systems and rhythms of academic and organisational life are geared to materials production on an
industrial scale. From positions of near-national monopoly over distance education, they now face vigorous competition from institutions unencumbered by their complex, Fordist assembly-line systems and lengthy timeframes. Developing more flexible, just-in-time responses to demands for particular courses will require fundamental changes to the value systems as well as complex internal relationships and roles of academics and other staff.

Real and virtual campuses

Distance education, by definition, takes education beyond the physical borders of a campus even when, as has been common in Sweden and Canada, much distance education has relied heavily on distributed face-to-face teaching. For campus-based universities, moving outside their walls and playing-fields can be a daunting experience. Increasing flexibility in who, where, when, what and how courses are taught and learned means that traditional physical boundaries lose their potency as identifiers of a learning community and its inhabitants. Moreover, as students increasingly mix and match their places of study, and as courses adopt mixed teaching strategies and technologies, the physical facilities requirements of campuses and networked study centres will change—in some cases, radically.

Daniel (1997) distinguishes two types of distance education: a synchronous form in which teacher and students are linked in real time; and an asynchronous form, in which a variety of media helps students study in their own learning environment when it suits them. Universities increasingly have several options with place as well as time—to teach on a campus, or in a physical dimension somewhere other than a campus, or in the virtual dimension of cyberspace—or all three. The concept of a virtual university is presently rather confused. Some emphasise a global market for on-line education, and fear the local consequences of having to compete with alliances of mega corporations and internationally prestigious universities. Others worry about the likelihood of cultural and linguistic imperialism in the ways in which virtual courses are designed and taught. For many universities, though, the immediate issues are how to develop a virtual presence alongside the physical one, so that students and teachers can move easily between the two. For the conventional university, this may well be its point of entry to a more comprehensive approach to flexible learning.

Some on-line technology initiatives are ignoring a sound lesson from distance education—the need to maximise interaction and student support—assuming instead that the technology alone will be sufficient to sustain the teacher-student relationship. The need for student support will be intensified in internationalised university programmes, when learners come from different cultural backgrounds, home languages and styles of learning and expression from those of the teacher, and remain in their own environment throughout their study. The twinning programmes developed in several Southeast Asian
countries during the 1980s by local organisations partnering overseas universities have shown the importance of local mentoring and a variety of learning and practical support programmes in assisting student success. They point the way to effective globalisation of education through a combination of local and on-line interaction.

Within national boundaries, study centres have long been an important part of distance education systems and have provided the model for effective international twinning programmes. Evaluations have consistently shown that they are most effective when they are embedded in the social life of the local community, and provide learning support, access to technologies not readily available to students, and a place for informal social interaction. When these roles are emphasised and integrated with communications technologies, they enable creation of virtual learning centre networks linking local communities with not one, but many, educational organisations. The TeleLearning Network of Western Australia is but one example; several Canadian provinces have others.

In some systems—for example, in Sweden, the UK and India—study centres have also offered a significant amount of face-to-face teaching. In Sweden, study centres have been akin to mini-campuses, contracting with various universities to provide nominated courses which the study centre believes are needed in the area. In the 1990s, the study centres have formed networks to negotiate with universities from strength. The largest network—called NITUS—comprises thirty-eight study centres and was initiated by local communities rather than government or the universities. Another (with the acronym KHIS) was established in the sparsely populated northern area of Sweden in the 1980s, initially as a project of Umeå University, and subsequently as a network of community-owned study centres and the three northern universities (Dahllöf, et al. 1993; Gisselberg 1993). Teaching strategies have relied predominantly on synchronous teaching through videoconferencing or face-to-face tuition (and students going to the campus for regular intensive programmes). As more courses are offered on-line and through other flexible learning strategies, this approach will become increasingly expensive for both university and study centre. It will also become unduly restrictive of student choice. On the other hand, the study centres, reinforced by their history of collaboration, are likely to have an even stronger role as virtual learning centres.

**Collaboration**

Collaboration has become an almost ubiquitous element of distance education over the last decade, but mostly as relatively discrete projects. Where flexible learning becomes the university's *modus operandi*, interuniversity collaboration is likely to be mainstreamed into course development and materials production, credit transfer and articulated pathways for entry,
teaching and support arrangements (including local learning centres) and investment in expensive technology infrastructures. University-external client collaboration is likely to become a major part of university programmes as custom-tailored courses are provided on a contractual basis. And university-communications technology company collaboration is likely to become a common feature of global on-line education provision.

Universities need cogent reasons to change as radically as this mainstreaming and flexibility imply. Collaboration is easy to justify on educational and social justice grounds if the outcome is improved access to a wider range of courses, study modes and support arrangements. By far the most pressing reason, however, is the lack of resources to meet demand. For some universities—especially younger, less prestigious ones—collaboration is becoming a basic survival strategy in an increasingly competitive and global environment. Sometimes there is little choice, where government forces universities into consortia or brokerage arrangements; success then hinges on the openmindedness with which the partners approach the project. Paradoxically, as is occurring in Australia, government may also be demanding that universities behave as industrial bodies competing against each other in a deregulated market. One outcome may be that universities cooperate less with each other and more with non-university partners or with universities in other countries.

Even with good will, collaboration is hard to achieve and sustain. Moran and Mugridge (1993) found three prerequisites for success, regardless of the particular features of the venture. First, a willingness on the part of all partners to accommodate different institutional cultures and practices by adapting one’s own practice to harmonise with partners. This can be hard enough within one social milieu; in the international arena it requires especial sensitivity to different assumptions about curriculum and pedagogy. The second prerequisite is the building of sustained relationships based on personal trust and shared values, typically through champions in each university in a position to negotiate and coordinate the arrangements. This trust needs also to be embedded in the interinstitutional relationship as well as in the interpersonal ones. Third, a successful collaboration requires that all partners perceive the mutuality of benefits involved. This is a binding force even where the consequences for each partner differ greatly.

Nevertheless, collaboration is burgeoning. Two aspects of particular interest for flexible learning are the expanding number of consortia and the growing number of international collaborative programmes. Canada’s Open Learning Agency was an early prototype, developing a credit bank in the 1980s which enabled students to choose from courses across a variety of institutions in British Columbia. The model was adapted in the 1990s by Open Learning Australia. Both have been predicated on marginal additional costs to partner institutions, but have experienced various problems caused by lack of trust and/or unwillingness to accommodate to different institutional cultures. The
Australian consortium has recently reformed with largely different partners and an explicit intention to collaborate in order to compete with other Australian universities as single entities.

In Sweden, in contrast, interuniversity competition is not as fierce, and social values of cooperation and compromise are strongly embedded in the culture. Three university consortia have emerged in the 1990s, with an emphasis on joint course development, materials production and credit transfer (for example, see Holmberg et al. 1996). In 1997, the three began discussions of ways to collaborate further among themselves with a view to increasing access, expanding the range of courses, and reducing costs. In addition, collaboration is seen as an essential strategy to help Swedish universities preserve and nurture Sweden’s unique cultural and linguistic heritage in the face of an increasingly globalised education system.

Conclusions—the future of flexible learning

The university, as an idea and as a social institution, has weathered profound changes since the twelfth century. Its modes of teaching have changed to accommodate new technologies (e.g., the printing press which enlarged access to accurately duplicated material from the 1450s); social movements (e.g., the advent of mass higher education since the 1960s); and changes in paradigms of knowledge (e.g., empirical scientific methods in the nineteenth century and postmodernism in the twentieth). The last forty years have been a period of dramatic growth and change, the pace of which is still accelerating, not least because of technological change. The authority of the nation-state is faltering against the power of multinational corporations, and states’ capacities to maintain resources for social welfare and education are threatened even while higher education and training are acknowledged as critical to prosperity and progress. Universities are being described and treated as industries rather than cultural and intellectual repositories and creators. They are also being forced to reassess the place, time and methods of their teaching. Today’s polarities of distance and face-to-face teaching cannot withstand the onslaught of declining resources, political pressures and institutional survival instincts.

Distance education, too, has weathered major changes to take advantage of new technologies and communications systems, and rise to the challenge of educating large numbers of people. Correspondence study became feasible as an organised form of university learning when reliable transport and communications systems became available from the late nineteenth century. Distance education flourished once television and print production systems became sophisticated and affordable. In the last twenty-five years, we have worked hard to achieve legitimacy and credibility (inside and outside universities) for distance education’s methods and the quality of students’ learning outcomes. Therein lies a paradox. At the moment when that hard
work is paying off in moving distance education from the margins to the mainstream, it is being transformed into something else. It is likely to be as hard for many distance educators to accommodate to flexible learning as it is for many in more conventional universities.

Nevertheless, flexible learning describes beliefs about teaching and learning which many academics and administrators already hold. It is not a brand-new discovery or something magic, but it does provide a means of bringing together the key facets of the paradigm shift which is now under way. In our experience, it is a way of making sense of an environment which is often confused and stressful, but which also offers exciting prospects for the university as a learning community. While in a sense doing ourselves out of a job, distance educators have valuable insights and experience to bring to the processes of integration and transformation which universities will experience in coming years.

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Note

1 We are indebted to Dr Carl Holmberg of Linköping University and personnel of the Distansutbildningskomitet (DUKOM) for their advice on developments in Sweden.

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The costs of distance education

Thomas Hülsmann

Educational decision-makers all over the world are confronted by a rising demand for education, a demand with which the budget allocation generally does not keep pace. The challenge is how to cope with the demand, drive down average costs and keep up or improve standards. At the same time increased flexibility is appreciated since learner constituencies change considerably, part-time and mature students representing an increasing percentage. In this situation educational managers turn towards distance education in the hope that it will offer convenience, cost and quality.

This chapter looks at costs and effects in distance education in order to provide some guidance to managers working in this field. Guidance for managers in distance education can be given in three ways: by drawing attention to structural features of distance education; by drawing attention to case study evidence available; and by putting forward a framework for cost-effective media choice.

Costing issues

In distance education the teacher and the student are separated most of the time. This necessitates the reorganisation of the learning process into two main teaching functions: instruction (content presentation) and dialogue (learner support). Instruction is provided via resource media and learner support via communication media. Resource media make it possible to provide students free-standing, pre-prepared objects such as course material in the form of books, cassettes or CD-ROM. Communication media allow dialogue, contributing to an educational process rather than providing course material; videoconferencing, telephone tutoring or lectures can be used in this way. Resource media allow economies of scale, communication media do not. The more students use a printed book or listen to a broadcast, the lower the unit cost of writing and producing the original text or programme; in contrast, the costs of using communication media to provide dialogue increase with each additional student. To improve the trade-off between economies of scale (a parameter of efficiency) and teacher-student interactivity (a parameter of
effectiveness), distance education designs interactivity into resource media (internal interactivity) while keeping control of the level of teacher-student interactivity (external interactivity). In Table 6.1 we distinguish between technologies in this way.

Cost-effectiveness analysis¹ is a technique designed to help choose between alternatives by examining their costs and effects. It requires us to measure the costs of alternative approaches to achieving the same result: preference is given to the strategy with the minimal ratio of costs over effectiveness scores. We can, therefore, carry out cost-effectiveness analysis at two levels: at the institutional level looking at the comparative costs of dedicated distance-teaching universities and of conventional universities and, at the course level, comparing the costs of different media configurations.

In order to be seen as cost-effective, distance education had to demonstrate that it is possible to teach effectively using media. The media equivalency hypothesis claims that media have little impact on outcome effectiveness, and teaching using media can be as effective as teaching conventionally. Understandably many distance educators subscribe to this hypothesis. On the other hand, distance educators are also interested in researching the capabilities of different media in order to make optimal use of them. There is a certain conflict, at least between the radicalised version of the media equivalence hypothesis (‘media do not influence learning under any condition’), and the effort to identify media capabilities in order to use them more effectively for teaching.

Once it is accepted that you can teach effectively using media, it is possible to look for economies of scale in distance education and so to establish that it can be cost-effective. Some of the costs of distance education are fixed: capital equipment, or the writing of course material, have costs that are the

<table>
<thead>
<tr>
<th>Table 6.1 Classification of open and distance learning technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resource media</strong></td>
</tr>
<tr>
<td>Examples</td>
</tr>
<tr>
<td>Type of interactivity</td>
</tr>
<tr>
<td>Cost structure</td>
</tr>
<tr>
<td>Timing</td>
</tr>
<tr>
<td>Pedagogy</td>
</tr>
</tbody>
</table>
same irrespective of the number of students enrolled. Other costs are variable: the cost of providing tutoring to students, for example, varies with the number of students. (In practice, fixed costs are often lower in distance than in conventional education because you can teach students at a distance without building classrooms, lecture theatres or student accommodation.) Provided the variable costs per student of distance education are lower than those of conventional education, we can also expect the total cost per student to show economies once we have enrolled enough students. Economies of scale, which seldom arise in conventional education where most costs are variable and are driven by staffing ratios, can be achieved in distance education. There is thus a breakeven point for an institution, or a course, at which the cost per student is the same for the two methodologies that are being compared. Whether student demand allows us to reach this point remains an empirical question. Case study evidence can help to identify the conditions under which cost-effectiveness of distance education can be achieved.

**Institutional costs**

Historically, distance education has served a niche market, responding to needs for flexibility of specific learners. The foundation of open universities signalled that distance education was ready to compete in the mainstream. As this necessarily entailed competition for funds, the question of the comparative cost-effectiveness of distance teaching institutions became important. The experience of the British Open University demonstrates the significance of fixed and variable costs and of potential economies of scale. In Table 6.2 we can distinguish three types of cost: some are clearly fixed, notably for the development and production of courses. Some are semi-fixed: the cost of the central administration does not need to change if student numbers increase or contract by 10 per cent, but will go up, in lumps, if there is an increase in scale beyond this. Some, for presentation, distribution and student support, are variable and vary with the number of students enrolled. As a result of the significant element of fixed costs, the university would be able to increase its total number of students by 10 per cent with only a 3 per cent increase in its total costs. To meet the increased central cost of servicing an extra 20 per cent of students, however, total costs would have to rise by 7 per cent. Thus the university has the potential to achieve economies of scale but we should not exaggerate their significance.

In comparing the cost-effectiveness of distance teaching and conventional universities we may look at the cost per student or the cost per graduate. There are, then, different methods of calculating the cost per graduate. Rumble (1997:125) discusses several options. One is based on the assumption that the system has already attained its steady state. In this case Rumble proposes to calculate: (1) cost per graduate=annual budget/annual number of graduates.
Table 6.2 Summary of the cost structure of the UK Open University

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Approximate percentage change in cost for x per cent change in student numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-10</td>
</tr>
<tr>
<td>Fixed</td>
<td>19.93</td>
</tr>
<tr>
<td>Development of courses</td>
<td>18.86</td>
</tr>
<tr>
<td>Production of courses</td>
<td></td>
</tr>
<tr>
<td>Semi-fixed</td>
<td></td>
</tr>
<tr>
<td>Central costs</td>
<td>29.22</td>
</tr>
<tr>
<td>Variable costs</td>
<td></td>
</tr>
<tr>
<td>Presentation and distribution</td>
<td>28.42</td>
</tr>
<tr>
<td>Student support</td>
<td>22.09</td>
</tr>
<tr>
<td>Total</td>
<td>118.52</td>
</tr>
</tbody>
</table>

Source: DES 1991:59; costs have been deflated to 1996 £. If, however, the institution awards different degrees, or the system is still expanding, it might be more convenient to calculate the cost per graduate by estimating the average time students are likely to need for graduating: (2) cost per graduate=recurrent cost per studentxnumber of years to graduation. If a drop-out rate is available (and little else) it is often convenient to calculate: (3) cost per graduate=(recurrent cost per studentxnumber of years)/graduation rate. The variant used by the British Open University is shown in Table 6.3. It assumes that it takes the average student 4.7 years to reach an ordinary degree and 7.4 years to reach an honours degree (a distinction between types of degree that was part of the university structure at the time of the study).

The German FernUniversität provides data on its costs per student and cost per graduate and demonstrates a different approach to their analysis. The FernUniversität does not consider cost per graduate to be an acceptable measure of cost-effectiveness on the grounds that many students do not enrol for a degree. Indeed 30 per cent of those entering the FernUniversität already have a degree. Therefore the FernUniversität uses cost per full degree equivalence, looking at the costs per credit and then examining the number of credits that need to be obtained to add up to a degree. The UKOU also argues that a performance measure based on CAT (credit accumulation and transfer) points awarded would be more appropriate (Daniel et al. 1994).

In Table 6.5, cost per student and cost per graduate are reported for a number of institutions. They show costs per student in five industrialised countries as falling between about 1,200 and 2,200 with only one Canadian institution falling outside this range. These costs are generally between 25 and 50 per cent of the cost per student in a conventional university. These comparisons are, of course, always difficult. One source of difficulty is that...
they usually omit opportunity costs which are of major importance in, for example, the National Technological University, which feeds teaching to its students’ place of work, thus providing major savings in costs of time and travel.

Given the consistency in the cost per students, the much greater difference in cost per graduate is remarkable. If cost per graduate is calculated on the basis of any of the formulae referred to above, the cost depends on the cost per student, the time the student is likely to spend in the system in order to graduate, and the drop-out rate. The number of years required for a degree does vary considerably between countries. The number of years to obtain the standard university degree in Japan is about four to five years in the conventional
Table 6.5 Some performance indicators in tertiary education

<table>
<thead>
<tr>
<th>Institution and date</th>
<th>Approx. annual enrolment</th>
<th>Cost per student</th>
<th>Comments on degree types</th>
<th>Cost per graduate</th>
<th>Comparison with conventional education</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athabasca (Canada) 1996/7</td>
<td>2,000(^a)</td>
<td>3,628</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UKOU (United Kingdom) 1989/90</td>
<td>25,000</td>
<td>1,683</td>
<td>BA ordinary</td>
<td>11,378</td>
<td>about 50% of CU(^d)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BA honours</td>
<td>15,923</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FernUniversität (Germany) 1993/4</td>
<td>56,000(^e)</td>
<td>1,473</td>
<td>including excluding engineering</td>
<td>68,940</td>
<td>the cost to the state is (\frac{1}{3}) to (\frac{1}{4}) of the regional CUs</td>
<td></td>
</tr>
<tr>
<td>NTU (United States) 1997/8</td>
<td>3,500</td>
<td>2,212</td>
<td></td>
<td>24,398</td>
<td>50% drop out</td>
<td></td>
</tr>
<tr>
<td>UAJ (Japan) 1991</td>
<td>1,205</td>
<td>weighted</td>
<td></td>
<td>68,330</td>
<td>30% of cost per student in CU; but up to 4 times the cost per graduate in CU(^i)</td>
<td></td>
</tr>
<tr>
<td>CTU Bourgogne (France) 1994–6</td>
<td>746</td>
<td>1,655</td>
<td>Maitrise</td>
<td>10,925</td>
<td>40% of on-campus alternative</td>
<td></td>
</tr>
</tbody>
</table>

Notes

a  FTE.
b  Personal communication.
c  There have been different estimates of the relative cost-effectiveness of the UKOU. We have included the recent one of Daniel (1996: 31).
e  Total number.
f  The average (over 6 faculties) is skewed by the costs of the electrical engineering faculty, hence we add the figure not including electrical engineering.
g  Fandel et al. 1996.
h  Personal communication: the 50% completion rate is mostly due to job changes after which students are no longer more eligible to company grants.
i  It is claimed that UAJ will be cost-effective when the steady state is achieved.
j  Muta and Takahiro (1994).
k  Based on Ben Abid 1997.

system and five to six years in Germany, contrasted with three years in Britain, so that our comparators are different. But, in the absence of other data, we must assume, too, that completion rates are notably higher in Britain and France, and for the postgraduate students of the National Technological University, than they are for the German and Japanese institutions.
The negative effect of drop-out rates can also be demonstrated for higher education in developing countries and here the argument that students might come for different reasons than a degree seems to be less convincing. Using early data from Sukhothai Thammathirat Open University we can illustrate the impact high drop-out rates have on cost per graduate. For the two-year programmes 1980/2 and 1982/3 the completion rates were 11.7 per cent and 24.8 per cent respectively (Wichit and Wangsotorn 1985) whereas the completion rate in the conventional sector was given as 85 per cent. The cost per student was between 179 and 261 in 1996 sterling. This gives a cost per graduate between 1,435 and 2,088. Though no figures are provided for cost per student, the graduation rate and the length of the course allow us to estimate that the conventional sector could spend about three to four times as much on their undergraduates and still have the same cost per graduate. As Table 6.6 shows, some remarkably low completion rates have been reported: less than 1 per cent for a two-year degree course at the Indonesian Universitas Terbuka for example. Most institutions report completion rates of about 30 per cent. Where degrees are longer, completion rates seem to drop significantly: a five-year degree at the Korean Air and Correspondence University reported completion rates for two periods of 9.8 and 14.5 per cent.

It seems in view of the recent data that Perraton (1991) may have to adjust downward his estimate that graduation rates for tertiary distance education were likely to range from 40 to 60 per cent with a cost per student between a half and two-thirds of that in conventional education. The data in Table 6.6 suggest a completion rate nearer to 25 per cent rather than 40 per cent. If we assume an 80 per cent graduation rate for conventional education, the figures suggest that a distance-teaching institution could aim at a cost per student of a quarter (0.25) of the cost per student in the conventional institution if it was to produce graduates at a comparable cost. But with a lower graduation rate the cost per student through distance education would have to be reduced to a factor of 0.156 instead of the 0.25 of the cost of conventional education for the cost per graduate to be comparable. Calculations of this simplicity, however, often ignore the dynamics such reductions can trigger: lowering the cost per student by, for instance, reducing learner support might induce a vicious circle in the drop-out rate with negative instead of positive effects on comparative cost-effectiveness. It is in this vein that Kishore (1997) suggests increasing investment in student support, hoping it will have a positive effect on cost per graduate. The only general conclusion which can be drawn is that reduction in per student expenditure must be well targeted as it could otherwise have an effect opposite to the one intended.

It might be conjectured that this has something to do with the better cost recovery rate in distance education. Quite often government funding for distance education institutions is low and contribution from student fees
Table 6.6 Completion and graduation rates at some open universities

<table>
<thead>
<tr>
<th>Institution</th>
<th>Type of course</th>
<th>Date</th>
<th>Enrolment</th>
<th>Graduation</th>
<th>Pass/completion rate %</th>
<th>Conventional university rate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>China TVU</td>
<td>equivalent to junior college degree</td>
<td>1988/9</td>
<td></td>
<td>&gt;80</td>
<td>n/a</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>India IGNOU</td>
<td>first degree</td>
<td>1991/2</td>
<td></td>
<td>22.5</td>
<td>55–60</td>
<td></td>
<td>b</td>
</tr>
<tr>
<td>YCMOU</td>
<td></td>
<td></td>
<td></td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRAOU</td>
<td></td>
<td></td>
<td></td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia UT</td>
<td>two-year degree</td>
<td>1984–8</td>
<td>65,000</td>
<td>443</td>
<td>0.7</td>
<td>n/a</td>
<td>c</td>
</tr>
<tr>
<td>Korea KACU</td>
<td>two-year degree</td>
<td>1977–85</td>
<td>10,837</td>
<td>3,684</td>
<td>34</td>
<td>n/a</td>
<td>d</td>
</tr>
<tr>
<td></td>
<td>five-year degree</td>
<td>1980–8</td>
<td>17,104</td>
<td>5,150</td>
<td>30.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1981–91</td>
<td>28,266</td>
<td>4,111</td>
<td>14.5</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Thailand STOU</td>
<td>two-year degree programme</td>
<td>1983–91</td>
<td>35,698</td>
<td>3,511</td>
<td>9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1980–2</td>
<td>82,139</td>
<td>9,594</td>
<td>11.7</td>
<td>85</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1982/3</td>
<td>69,561</td>
<td>17,236</td>
<td>24.8</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

Source: This table is based on Perraton (forthcoming) but the data are from the sources cited in the references.

Notes:

relatively high: the Indian government meets 71 per cent of costs at IGNOU with students' fees contributing 26 per cent. In Thailand STOU receives 24 per cent from the government and the rest from students. Korea receives 50 per cent and Sri Lanka 56 per cent from government. In this case the degree is especially important in order to allow the student to recover the private investment in education.

**Costs of media**

Within a project funded by the European Commission SOCRATES programme, we have been collecting data on the costs of media used within
open and distance learning. These make it possible to answer some questions about the cost-effectiveness of alternative media. There are, however, conceptual difficulties in doing so. If we assume, as already proposed, that media can be regarded as being equivalent in their effectiveness, we cannot at the same time seek to rank them in terms of student performance. In order to compare them we therefore suggest considering learning time as a proxy for effectiveness and asking about the cost per student learning hour. Once this is established for any particular medium, the manager has a default rule for cost-effective media choice to give preference to the medium with the lowest cost per student learning hour. The manager may then move away from the default rule when course designers can convincingly argue that specific tasks require different media.

**Student learning hours**

Some types of media, such as broadcasting or the use of cassettes, lend themselves easily to measurement in student learning hours. In these cases we can take exposition time as learning time so that one hour of following a television lesson is equivalent to one student learning hour. In the case of print we need to make an assumption about the length of time the average student will spend on printed text of a given length. Following the practice of a number of distance-teaching institutions, we have taken fifty pages of print as providing ten to fifteen student learning hours (SLH). It is even more difficult to estimate the time a student will spend using interactive media, such as CD-ROM, so that it is necessary to ask the course designer how much time students are supposed to spend with the medium in question.

On these assumptions, we can identify the cost of developing materials per SLH in each medium, which we have done partly on the basis of reports in the literature, partly on case studies carried out at a number of European institutions of higher education. Figures for the costs of resource media are set out in the Appendix, Table 6A.1. For many communication media, it is much more difficult to relate costs to student learning hours, mainly because the amount of time used for interaction is not tightly controlled. Estimates are given in Appendix Table 6A.2.

It was not always possible to attribute costs to the different media; staff often spend time working in more than one medium so that, in the absence of sophisticated activity costing, it is not possible to attribute their time to different media. In some cases, too, there are difficulties in inferring the number of student learning hours for a particular educational package. The increasing adoption of credit accumulation and transfer (CAT) frameworks is making it possible to infer the SLH from the CAT value of the course so that these calculations may become easier in the future. In practice, however, the SLH inferred from the CAT value is often
Table 6.7 Development cost per student learning hour by medium

<table>
<thead>
<tr>
<th>Medium</th>
<th>Cost per SLH</th>
<th>Ratio to print cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print</td>
<td>500</td>
<td>1</td>
</tr>
<tr>
<td>Radio</td>
<td>27,000</td>
<td>×50</td>
</tr>
<tr>
<td></td>
<td>15,000</td>
<td>×30</td>
</tr>
<tr>
<td>Television</td>
<td>125,000</td>
<td>×250</td>
</tr>
<tr>
<td></td>
<td>90,000</td>
<td>×180</td>
</tr>
<tr>
<td>Video</td>
<td>84,000</td>
<td>×170</td>
</tr>
<tr>
<td></td>
<td>18,000</td>
<td>×36</td>
</tr>
<tr>
<td>Audio</td>
<td>17,000</td>
<td>×34</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>20,000</td>
<td>×40</td>
</tr>
</tbody>
</table>

Currency 1996 £ sterling

bigger than the SLH calculated on the basis of the provided inputs, reflecting assumptions made by course administrators about the amount of time spent by students studying independently. Table 6.7 gives a synopsis of our findings.

**Comparative costs**

The evidence we have collected is consistent enough for us to reach several general conclusions. The importance of scale is confirmed: reasonable average costs can be achieved, even with high costs per student learning hour, where there is a high enough enrolment on a particular course. One challenge is therefore to design resource material in a reusable form so that it can be made available to the maximum audience. We draw four other main conclusions.

First, text is all important. Education is heavily reliant on text: no matter what the medium, educators usually start with a text so that its development always forms one core cost. Indeed, it is difficult to separate development cost per medium because the text also provides the script which integrates the non-textual elements. Text is, too, generally the most cost-effective medium with the lowest cost per student learning hour. Video and audio cassettes have considerably higher development costs. They have often been treated by course developers as add-ons, provided to increase the interest and attractiveness of a course, and to distinguish it from a simple correspondence course.

Second, text can be presented either in print or on screen. The development costs are the same as long as the text is not re-edited in hypertext format. Where material is presented on screen, with the intention that the students should download it, the costs of distribution and of printing move from the institution to the learners. If the text is a simple one, with no further facilities,
such as search capacities, learners as well as providers tend to prefer the printed format. The effectiveness of providing enhancements to text depends on the learning objectives. Increased interactivity increases demand on student time so that, for example, hypertext formats are not always seen as an advantage to students and may also disorient them.

Third, teaching by means of networked computers has a substantial effect on the cost structure and on development costs. It makes it possible to increase internal interactivity between a student and the text but at an increased development cost per student learning hour. It can provide new opportunities for external interactivity, and so reduce the delay in getting feedback from a tutor. While this may have educational and social benefits, it puts pressure on student support costs and is therefore likely to reduce scale economies. It is unlikely that this increases effectiveness, where this is assessed against print-based curricula, although other educational benefits may be identified.

Fourth, more advanced technology tends to increase reception costs, so that the cost to the learner is increased. There is a danger that the drive for more technology will widen access differentials to distance education, both nationally and internationally and so a threat that the new styles of teaching, that can readily go across barriers of distance, may at the same time widen rather than narrow the differentials between industrialised and developing countries.

Notes

References


Kim, S. (1992) Distance Education in Korea, Seoul: Korea Air Correspondence University.


Orivel, F. (1987) Costs and Effectiveness of Distance Teaching Systems, Dijon: IREDU.


<table>
<thead>
<tr>
<th>Media Type</th>
<th>Unit</th>
<th>Development cost</th>
<th>Production cost</th>
<th>Distribution cost</th>
<th>Reception cost</th>
<th>Cost per SLH as compared to print cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fixed/capital</td>
<td>Variable/capital</td>
<td>Variable/capital</td>
<td>Variable/capital</td>
<td>Variable/recurrent</td>
</tr>
<tr>
<td>Print</td>
<td>50ppb</td>
<td>6,000</td>
<td>1</td>
<td>0.5</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>Broadcasting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x1c</td>
</tr>
<tr>
<td>Radio</td>
<td>60 min.</td>
<td>30,000</td>
<td>nil</td>
<td>120</td>
<td>radio set 100</td>
<td>nil</td>
</tr>
<tr>
<td>TV</td>
<td>60 min.</td>
<td>120,000</td>
<td>nil</td>
<td>700</td>
<td>TV set 500</td>
<td>90/year</td>
</tr>
<tr>
<td>Cassettes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x50</td>
</tr>
<tr>
<td>Audio</td>
<td>60 min.</td>
<td>16,000</td>
<td>1</td>
<td>near to 1</td>
<td>cassette radio 250</td>
<td>nil</td>
</tr>
<tr>
<td>Video</td>
<td>60 min.</td>
<td>60,000</td>
<td>2–3</td>
<td>near to 2</td>
<td>video TV 800</td>
<td>90 p.a.</td>
</tr>
<tr>
<td>PC media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x25a</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>disc</td>
<td>80,000</td>
<td>2–4</td>
<td>near to 1</td>
<td>PC/CD-ROM drive 1,000</td>
<td>nil</td>
</tr>
<tr>
<td>Internet</td>
<td>5 MB</td>
<td>6,000</td>
<td>nil</td>
<td>120 p.a.</td>
<td>PC + modem 1,000</td>
<td>110 p.a. + 5 p.h.</td>
</tr>
<tr>
<td></td>
<td>10 MB</td>
<td>12,000</td>
<td>nil</td>
<td>600 p.a.</td>
<td>PC + modem 1,000</td>
<td>110 p.a. + 5 p.h.</td>
</tr>
<tr>
<td></td>
<td>n x10MB</td>
<td>40,000</td>
<td>nil</td>
<td>1,000 + n x100m</td>
<td>PC + modem 1,000</td>
<td>500 p.a. + 9 p.h.</td>
</tr>
</tbody>
</table>

*Currency £ £ sterling
SLH stands for Student Learning Hour.

In terms of SLH we generally assume that 50pp print is equivalent to 10 SLH.

In this column we write down the cost of development per SLH against the standard of the development costs of 50pp print being taken as equivalent to 10 SLH.

It would not be unreasonable to assume that a cassette of 60 min. might generate more than one SLH since it might be used several times. This would cut the factor down to 12. However, similar assumptions could be made for the broadcasting media since in practice, they are also recorded.

Obviously ‘disc’ is an unsatisfactory unit of measurement. This cost estimate is based on a case study. To cost CD-ROM properly it would be necessary to develop a bench-marking system specifying to which use the CD-ROM is put.

5MB is the minimum amount of memory space for keeping a Web site.

This is for 50pp equivalent of printed text. Obviously pages are not appropriate units in a digitised medium (the ASCII code equivalent of 100 KB might be more appropriate). Reference to the unit of printed text is made since the core costs refer to authoring which is independent of the medium. Without further cost text can be converted from typical DTP formats like Word into the Internet html format.

The core development costs for printed texts and digitised texts are the same. Unit costs incurred by the provider are higher for print. If, however, the unit costs of reception are included, unit costs are higher.

The additional cost for re-editing a 50pp text as hypertext is calculated on the basis of 6 hyperlinks per page on the average. To put them in and check if they work costs about an hour. Hence 1 hour per page or in total 50 hours or 6 full working days costing £200 each.

The development costs are higher for a hypertext. However, it is possible to argue that the increase in internal interactivity (e.g. including multiple choice questions type of self-assessment) will considerably increase the number of student learning hours generated.

The more you want to put on your Web site the bigger the memory space has to be leased on a server. Additional memory space is to be bought in blocks of 10 MB.

We treat multimedia as being an on-line equivalent to CD-ROM. As in the case of CD-ROM multimedia resources provided over the Internet may include sound, images and films on top of text.

The additional cost of each block of 10 MB adds £100 on top of a base charge of £1,000.

Multimedia requires higher bandwidth which suggests the installation of an ISDN line (or an equivalent bandwidth increasing option).

The higher recurrent costs reflect the use of higher bandwidth.

Since we have treated the development cost of multimedia resources as being similar to those provided as CD-ROM, the factor will be the same as for CD-ROM.
<table>
<thead>
<tr>
<th>Service Type</th>
<th>Providing institution setting-up costs</th>
<th>Equipment costs</th>
<th>Personnel costs</th>
<th>Line costs</th>
<th>Reception equipment costs</th>
<th>On-line costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face tutorial</td>
<td>nil</td>
<td>nil</td>
<td>20–80 p.h.</td>
<td>nil</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>Correspondence/TMA Telephone</td>
<td>nil</td>
<td>standard</td>
<td>20 to 80 p.h.</td>
<td>postage less than 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>nil</td>
<td>standard</td>
<td></td>
<td>telephone charges</td>
<td>telephone</td>
<td></td>
</tr>
<tr>
<td>Computer mediated</td>
<td>Web site 1,200</td>
<td>PC + modem</td>
<td>20 to 100 p.h.</td>
<td>host charges about 700 per year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>communication</td>
<td>Web site 2,000</td>
<td>VCS’ (room based) 40,000</td>
<td>9–25 p.h. for 128–384 Kbps ISDN connect charges 200</td>
<td>nil</td>
<td>110–150 base charges</td>
<td>4–5 p.h.</td>
</tr>
<tr>
<td>Videoconferencing</td>
<td>dedicated classroom may be provided</td>
<td></td>
<td>160 p.h.</td>
<td>PC + modem 1,000</td>
<td>1,000–20,000 m</td>
<td>9–25 p.h. for 128–384 Kbps ISDN connect charges 200</td>
</tr>
</tbody>
</table>