E-education - Whose benefits, whose costs?

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It is some 40 years since the Open University was first conceived, 32 since it was legally established, and 30 since it began teaching. This period has seen great changes but arguably the greatest is one still in the making. I refer, of course, to the Internet. Many argue that we are in a period of paradigm shift, from the industrial to the information age. In such circumstances all organisations have to rethink, but who will benefit from the changes, and who will bear the costs? In this lecture I shall seek to answer these questions. I shall do this, first, by defining what we mean by e-education; second, by identifying some of the benefits that have led to the pressures to adopt e-education; third, by looking at the cost implications of change; and finally, by looking at some of the structural implications of change.

Defining the field: What exactly is an e-education system?
It is worth starting by trying to establish exactly what we mean by an e-education system. Interpretations differ, but a fully 'e' education system would, I suggest:

- Make learning materials available to students in electronic form.

- Teach and support students online

- Provide on-line administrative services, e.g. enrolment, billing, information and advice.

This may seem obvious, but there is enough evidence to support the view that a fully rounded vision of e-education does not always exist. To begin with, academics tend quite reasonably to focus on the development of Web-based course materials and the use of the Web to support students' learning within a course – and forget the e-administrative aspects of the system. More crucially, however, distance education, and particularly large-scale distance education, is based on a division of labour between those academics and support staff who design and develop learning materials, and those who focus on student support. These divisions are strong enough for quite distinct cultures to be observable in distance teaching organisations[1]. They can be detected within the online learning community – between those who tend to focus on the Web as a means of getting materials into electronic format, and those who see online learning as a means of enhancing communication. The first approach is evidenced strongly in the *Business Model for the e-University*, which talks about 'an e-version of programmed learning books'[2]. The latter is the focus of those who advocate Computer Mediated Communications (CMC) and Asynchronous Learning Networks (ALNs).

Pressures to move towards e-education
There are widespread pressures to move towards e-education – from distance educators, from those working in campus settings, from trainers, and from new entrant firms such as Merrill Lynch, Banc

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[1] Costello, N. (1993) 'Organisational cultures and distance learning', *Open Learning*, 8 (3), 3-11.
[2] PricewaterhouseCoopers (2000) *Business model for the e-University*, Main report, paragraph 52: available through http://www.hefce.ac.uk/pubs/HEFCE/2000/00_44.htm

One, and a host of venture capital groups who see Internet education and training as the next 'Killer App'[3]. In this lecture, however, I shall focus mostly on e-education's impact on universities.

(a) Pressures within distance education

Distance education had its origins in commercial correspondence colleges. While there were some excellent providers, many more were interested in the economics of the diploma mill and 'drop-out money'[4]. This maximised profit at the expense of teaching quality, student success, and ultimately of reputation.

By the 1970s this shady past was being put behind us. The best providers, both public and private, wanted to offer accessible educational opportunities, based on quality materials, leading to reputable qualifications. Additionally, many wanted to do this at a cost to the student that would enable those from disadvantaged backgrounds to participate. It is to their credit that institutions such as The Open University and the National Extension College had a lot to do with the establishment of this ethos.

Notwithstanding this, distance education continued to be seen as second best because, at the expense of dialogue, it separates the teacher and the learner. The argument that it provides opportunities for 'guided didactic conversation'[5] is clearly unconvincing, but even those systems such as the Open University that built in some face-to-face tuition weaken its impact, firstly, by making participation voluntary, and secondly, by getting tutors to more or less restrict themselves to the content defined by the materials. As a direct result distance education, at least at the higher education level, is seen to be deficient because it fails to provide an environment within which social and cultural learning can take place[6], and within which democratic discussion and argument could flourish[7].

Of course, neither of these criticisms is wholly fair. Campus-based universities are often far from perfect[8] given the prevalence of overcrowded lectures and the lack of opportunities in large institutions for students to know and hence to discuss their ideas with either their teachers or even their peers[9].

Still, it is this perceived deficiency in earlier forms of distance education that led to the interest in computer-mediated communications and asynchronous learning networks[10], whose defining characteristic is to provide 'substantial, rapid, asynchronous activity with others'[11], in contrast to other, inferior, distance teaching models, such as the predominantly American models of synchronous audio or video presentations and conferences, and videotaped courses, and the basically European model of teacher-driven, mail-based correspondence courses[12].

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[3] Peterson, R. W., Marostica, M. A., and Callahan, L. M. (1999) *E-Learning: Helping investors climb the e-learning curve*, Minneapolis, US Bancorp Piper Jaffray.

[4] See, for example, David Noble (1999) *Digital Diploma Mills. Part IV, Rehearsal for the revolution,* at http://communicationucsd.edu/dl/ddm4.html

[5] Holmberg, B. (1995, 2nd. edn.) *Theory and Practice of Distance Education*, London, Routledge, pp.47-50.

[6] Escotet, M. (1980) *Tendencias de la Educación Superior a Distancia*, San José, Costa Rica, Editorial Universidad Estatal a Distancia, pp. 11-19.

[7] Harris, D. (1987) *Openness and Closure in Distance Education*, Barcombe, The Farmer Press, p. 142.

[8] A point acknowledged by David Harris – c.f. Harris, D. (1987) *Openness and Closure in Distance Education*, Barcombe, The Farmer Press, p. 142.

[9] Ritzer, G. (1993) *The McDonaldization of Society*, Pine Forge Press, Thousand Oaks, CA., pp. 141-2. Ritzer talks about the growth in irrationality within the large campus-based university, with many staff and students put off by 'the huge factory-like atmosphere of these universities' where education can be 'a de-humanising experience' in which it is difficult for students to get to know other students and virtually impossible for them to know their professors (Ritzer, 1993: 141-2).

[10] See, for example, Harasim, L. (1989) 'On-line education: a new domain', in Mason, R. and Kaye, A. (eds.) *Mindweave. Communication, Computers and Distance Education*, Oxford, Pergamon Press, p. 62. Harasim sees CMC as providing 'a new learning domain which enables us as educators and as learners to engage in learning interactions more easily, more often and perhaps more effectively, but also to develop qualitatively new and different forms of educational interactions'.

[11] Mayadas, A. F. 'How the term "ALN" came about?', http://www.alnorg/alnweb/aln.htm

[12] Mayadas, A. F. 'How the term "ALN" came about?', http://www.alnorg/alnweb/aln.htm

Note that within the context of these views, those who merely place the emphasis on getting material up on the Web have not made any progress at all.

(b) Pressures within the campus environment

What is interesting, though, is that the advantages of CMC are seen to accrue not just within distance education, but also for traditional students. Working out of the Ontario Institute for Studies in Education, Linda Harasim argued that CMC would enable *traditional* students not only to control the time, place, pace, and nature of interaction, but also to access a great deal more class time since this would no longer be confined by the finite time allocated to *face-to-face* classes [13].

Why exactly is CMC interesting to traditional educators? There are, I think, two strands of argument. The first, exemplified by Harisim's comment, believes that online interaction with your teacher and peers gets round the increasing irrationality of large campus universities where education can be 'a de-humanising experience', in which it is difficult for students to get to know other students, and virtually impossible for them to know their professors[14]. In these circumstances, and as ALNs increasingly move beyond textual messaging to audio and video messaging, they can actually provide an experience that is better because it is both more immediate and more personalised.

The second strand at the increasing trend for higher education to be seen as just one more consumer good. To understand this we need to look at what has been happening in traditional higher education where, according to one US report, students 'are bringing to higher education exactly the same consumer expectations that they have for every other commercial enterprise with which they deal'[15]. What students want, the report suggests, is 'a stripped-down version of college without student affairs, extracurricular activity, residence life, varsity sport, campus chaplains…', one that provides 'high-quality products but … low costs', and one where education is close to home and operates 'during convenient hours – preferably round the clock'[16].

The American sociologist George Ritzer argues that, to satisfy these students, universities will embrace technology because students are attracted to high-tech environments; because technology promises to lower university costs[17]; and because technology promises to deliver programmes both to satellite campuses near where they live, and, like Domino's pizzas, into their homes[18]. Convenience education, like convenience foods, is with us. Indeed, officials at the University of Northern Arizona specifically claim that their university is 'designed around the concept of convenience for the student'[19]. Integral to this is the delivery of distance and online education courses for home consumption. What is delivered is content and, possibly, interaction.

A summary of the argument to date

Let me just summarise briefly where I think we have got to. There seem to be two quite different interpretations of what is meant by online education Whether their background is in traditional or distance education, some are talking about interactivity and dialogue; and some are talking about putting materials up on the Web. Those who want to put material up on the Web believe that such material can provide high quality, interactive, and accessible, learning. Those who believe in CMC/ALNs think that it will overcome, on the one hand, the lack of dialogue in distance education, and on the other, the increasing anonymity and loneliness of a dehumanised campus. The pressures to go electronic are clear – but what will it cost?

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[13] Harasim, L. (1989) 'On-line education: A new domain', in Mason, R. and Kaye, A. (eds.) *Mindweave. Communication, Computers and Distance Education*, Oxford, Pergamon Press, p. 60.

[14] Ritzer, G. (1993) *The McDonaldization of Society*, Pine Forge Press, Thousand Oaks, CA., pp. 141-2.

[15] Levine, A. (1993) 'Student expectations of college', *Change*, September/October, p. 4.

[16] Levine, A. (1993) 'Student expectations of college', *Change*, September/October, p. 4.

[17] Ritzer, G. (1998) *The McDonaldization thesis*, Sage Publications, London, p. 154.

[18] Ritzer, G. (1998) *The McDonaldization thesis*, Sage Publications, London, p. 11: 'like Domino's, universities are increasingly in the business of home delivery'

[19] Howard, E. G. 1996, 'Satellite Solution: Popping up like Dandelions, Satellite Campuses tighten Bond of Learning, Students', *Kansas City Business Journal*, 14, sec. 1, p. 7.

The costs of distance education

Over the last 40 years the distance education market has grown enormously, but with 135 million children of primary school age currently not attending school, 1 billion adolescents and adults under-literate or illiterate, and 2 billion individuals requiring some kind of retraining and re-skilling in their lives[20], there is still plenty to do. Indeed, distance education can only increase in importance as the world population moves beyond its current estimated 6.1 billion[21] towards perhaps 9.5 billion by 2050[22]. Given the size of the challenge we face, it seems likely that the cost of meeting demand will be high on government agendas.

Traditional education is a labour intensive business. However, world-wide, the public sector's ability to pay for education is severely tested. Generally governments are looking for ways to reduce or at least contain the cost. One way is, of course, to pass the cost on to the consumer. Another is to find ways of reducing the unit cost of education.

In the 1960s the application of mass communications technology came to be seen as a way of lowering the unit costs of education by substituting capital (in the form of course materials) for labour[23]. The result was a flurry of interest by economists who set out to do two things. First, to study the costs of particular systems – but most notably educational television (ETV) and open university systems, and second, to develop methodologies for studying the costs of educational technology[24].

As a result of this work it was agreed that distance education *could* be more cost efficient than face-to-face education, but also that this was not always the case given the range of factors that influence costs. In brief, if you want to lower institutional costs in distance education, not only do you need to:

- Go for high population courses
- Restrict the number of course options
- Go for long course lives, and
- Choose low cost media and technologies

but you will also have to:

- Avoid cost-inducing actions, for example, the use of copyrighted materials, and
- Pass costs on to the student, either as charges, or by moving the system boundaries so that activities you might have paid for are now paid for by them.

In addition, and surprisingly given its crucial impact on costs, this has hardly been acknowledged in the literature[25], you will have to adopt structures and labour policies that minimise costs. In other words, you will need to:

- Employ people on contracts *for* service to develop courses and teach students, rather than on contracts *of* service (i.e. hire them as casual labour)
- Establish working practices that reduce the costs of labour by, for example, designing courses to be wrapped-around existing textbooks rather than developing new materials, and using author-editor models of course design, rather than big course team models

[20] Dhanarajan, R. (2001) 'Distance education: Promise, performance and potential', *Open Learning* 16 (1), 61-8, p. 67.

[21] U.S. Bureau of the Census, International Data Base, as at 1 January 2001. http://www.census.gov/ipc/www/world.html

[22] U.S. Bureau of the Census, International Data Base, estimate as at 10. 5. 2000: http://www.census.gov/ipc/www/worldpop.html

[23] Jamison, D. T., Suppes, P. & Wells, S. (1974) 'The effectiveness of alternative media: A survey', *Review of Educational Research*, 44 (1), 1-67, p. 57.

[24] For an account of this work, see Rumble, G. (1999) 'Cost analysis of distance learning', *Performance Improvement Quarterly*, 12 (2), 122-37.

[25] But see Rumble, G. (1997) *The costs and economics of open and distance learning*, London, Kogan Page, pp. 78-91. Even recent commentators fail to acknowledge the impact different structure and labour market solutions can have on system costs – c.f., for example, Hülsmann, T. (2000) *The costs of open learning: a handbook*, Oldenburg, Bibliothecks-und Informationssystem der Carl von Ossietsky Universität Oldenburg.

- Use technology to increase the student load per academic or administrator
- Increase the teaching load of academic staff at the expense of other functions – for example, research and public service, and …
- Reduce the cost of labour through 'labour for labour' substitution – the replacement of expensive academic labour by student and adjunct labour, which is cheaper.

Technology can help here by facilitating new structures, thus enabling managers working in distance education to choose those structures, work roles, and patterns of employment that reduce costs. I have no doubt that we will be told that the structural changes are the outcome of technological choices that are themselves driven by the market, but don't you believe it. It is not technology that drives structural change, but management – and management will be driven by competitive pressures to reduce costs[26].

As one would expect, the development of e-education is changing the costs of education. Online education is clearly different to earlier generations of distance education[27] and, of course, to traditional models of education. It involves different technologies, and it enables different structures and labour policies to be deployed. Both traditional and distance education institutions are now adopting online education – and this is affecting their costs.

Costs of e-education

I will structure my discussion of the costs of e-education as follows: first I will look briefly at the current concern with how one should cost e-education, and in essence dismiss it as a fairly unimportant detail. Second, I shall look at the costs of the technologies, distinguishing between the costs of putting e-materials online, the costs of e-teaching, and the costs of e-administration. Finally, I shall look at how the costs of e-education seem to compare with the costs of face-to-face education, and with the costs of alternative approaches to distance education.

(a) Costing e-education

There is currently a fair amount of discussion about how one should cost online education[28]. Technically, I don't think this is a real issue, though there is some uncertainty about what ought to be included in the costs. In my view cost studies ought to cover the costs of:

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[26] The emphasis here is on technology opening up possibilities, rather than determining them. In the 1960s and early 1970s it was thought that the most important single factor that gives an industry its distinctive character is its technology, which thus generated specific forms of work organisation and worker experience (c.f. Blauner, R. (1964) *Alienation and Freedom*, Chicago, Chigaco University Press, p. 6, 8; Bell, D. (1960) *The End of Ideology*, Glencoe, Ill., The Free Press; Bell, D. (1973) *The Coming of Post-industrial Society*, New York, Basic Books; Kerr, C., Dunlop, J. T., Harbinson, F. H. and Myers, C. A. (1964) *Industrialism and Industrial Man*, London, Oxford University Press). This is technological determinism, it was widely held in the 1960s and early 1970s, and it has been comprehensively discredited (Grint, K., and Woolgar, S. (1997) *The Machine at Work. Technology, Work and Organization,* Cambridge, Polity Press, pp. 11-14). Far from espousing technological determinism, I believe that a range of structural and labour market solutions are available, and it is for distance education managers to choose from among the many options available.

[27] Conventionally, following Nipper, S. (1989) 'Third generation distance learning and computer conferencing', in Mason, R. and Kaye, A. (eds.) (1989) *Mindweave: Communication, Computers and Distance Education*, Oxford, Pergamon Press, three generations of distance education systems have been identified: (1) correspondence education systems; (2) multi-media systems, and (3) online systems. I favour a four generational model, viz. (1) correspondence education, (2) educational broadcasting, (3) multi-media approaches, and (4) e-education approaches.

[28] See for example, Bacsich, P., Ash, C., Boniwell, K., Kaplan, L. with Mardell, J. and Caven-Atack, A. (1999) *The cost of networked learning*, Sheffield, Sheffield Hallam University, Telematics in Education Research Group; Boucher, A. (1998) 'Information Technology-based Teaching and Learning in Higher Education: a view of the economic issues', *Journal of Information Technology for Teacher Education*, 7 (1), 87-111; and Whalen, T. and Wright, D. (1998) *Cost-benefit analysis of web-based tele-learning: Case Study of the Bell Online Institute Pilot Project*, University of Ottawa, Faculty of Administration.

1. Developing e-materials.

2. Teaching students on-line.

3. Administering students online.

4. Providing the infrastructure and support within which e-education can operate.

5. Planning and managing e-education[29].

How do current cost studies measure up against this list? The few cost studies that exist focus on the costs of providing e-materials and e-teaching. There are no studies, to my knowledge, of the costs of e-administration within education. None of the studies comprehensively identify overhead costs. One has to go outside the literature on distance education to begin to get an idea of the costs of e-business, and even then what literature there is, is generally unsatisfactory.

(b) Costing the technologies of e-education

Setting aside the question of overhead costs for the moment, the major operating costs of e-education can be usefully considered under three heads: the costs of developing and distributing Web-based materials, the costs of Web-based communications, and the costs of Web-based administration. I shall take these in order.

(i) Costs of developing and distributing Web-based materials

Most of the technologies involved in Web-based courses have been around for a long time. They include the preparation of text, audio, video, computer-based tutoring, intelligent tutoring, exploratory learning, simulations, etc[30]. What is distinctive is that these materials are now being put up on a web site that can then be accessed by students.

Cost studies show that while there is a very wide range in the reported costs of developing CBT and CD-ROMs[31], the technology is generally marked by its high fixed costs[32]. There are attempts to quantify these costs. Thomas Hülsmann's recent book on *The Costs of Open Learning*, for example, studies the costs of 11 courses offered by 9 different European distance teaching organisations, and attempts to use the results to identify the cost of developing and delivering the equivalent of one student learning hour through a range of different media and technologies[33]. Print is the cheapest medium to develop at £350 per student learning hour. Putting text up on the internet costs at least twice that, and possibly more. After that costs escalate through audio, CD-ROM, video and TV.

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[29] See Rumble, G. (2001) 'Costing Networked Learning' – currently out to review.

[30] On computer-based tutoring, intelligent tutoring, exploratory learning, simulations, etc., see Van der Brande, L. (1993) *Flexible and Distance Learning*, Chichester, John Wiley & Sons, pp.18 ff.

[31] See on CBT costs, NBEET (National Board of Employment, Education and Training) (1994) *Costs and quality in resource-based learning on- and off-campus. Commissioned Report no. 33*. Canberra, Australian Government Publishing Service, p.37; and on CD-ROM costs, Hülsmann, T. (2000) *The Costs of Open Learning: A Handbook*, Oldenburg, Bibliothecks-und Informationssystem der Carl von Ossietsky Universität Oldenburg, p.14.

[32] Bates, A. W. (1995) *Technology, Open Learning and Distance Education*, London, Routledge, p. 6.

[33] Hülsmann, T. (2000) *The Costs of Open Learning: A Handbook*, Oldenburg, Bibliothecks-und Informationssystem der Carl von Ossietsky Universität Oldenburg, p. 17. Hülsmann suggests that for every £1.00 you spend developing a Student Learning Hour of printed material, you will spend twice as much for print on the internet, 5 times as much on audio, 40 times as much on a CD-ROM, 100 times as much on video, and 350 times as much on TV. The relative costs are per Student Learning Hour are shown in the Table.

The costs of developing one student learning hour in different media (UK£)
(based on Hülsmann, 2000, p. 17)

Print	350
Internet	700
Audio	1,700
CD-ROM	13,000
Video	35,000
TV	121,000

I personally take Hülsmann's figures with a pinch of salt: firstly, only one of his case study institutions uses TV – the Open University, but we know that Open University costs in this area are very much at the high end of the range, and his cost of £121,000 for a one hour programme is unrepresentative of the range of costs that can exist[34]; secondly, his assumption that the playing time for video and audio programmes is equivalent to the time students spend studying them is questionable; and thirdly, in giving rather exact guidance on the relative costs of these media, he ignores the fact that even within the confines of the 11 courses he studied, there were considerable variations in cost per Student Learning Hour for print, audio, and video[35].

Nevertheless, Hülsmann's belief that computer-based materials are more expensive than print and audio[36] is one that I am happy to accept provided that one also takes account of the differential costs of the media built into the computer-based materials. After all, Arizona Learning Systems found a wide variation in the costs of developing a course, of from US$6000 to $1,000,000 for a three unit internet course, depending on the approach used. Much of this is the cost of academic and technical labour. The cheapest approach involved the presentation of simple course outlines and assignments; the most expensive, at $1,000,000, involved virtual reality[37]. There is also some evidence that the lower levels of cost are more likely to be found on synchronous online course, with asynchronous courses costing more. Certainly Whalen and Wright found significant differences between synchronous and asynchronous course development costs. The former required much less development time because they involved less media[38].

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[34] See, for example, NBEET (National Board of Employment, Education and Training) (1994) *Costs and quality in resource-based learning on- and off-campus. Commissioned Report no. 33*. Canberra, Australian Government Publishing Service, pp. 36-7. The cost of making educational videotapes for use by distance education students ranged from Aus$1000 to Aus$39,400 per 30 minutes, with the higher level cost being for broadcast quality material made in association with the ABC.

[35] On p. 147 of his book Hülsmann notes a range of costs per Student Learning Hour for print (£139 – £1500), audio (£1000 - £16,000), and video (£3159 - £80,000), which makes his reliance on the relativities given on p. 17 all the stranger – c.f. Hülsmann, T. (2000) *Costs of Open Learning: A Handbook*, Oldenburg, Bibliothecks-und Informationssystem der Carl von Ossietsky Universität Oldenburg, pp. 17, 147.

[36] Hülsmann, T. (2000) *Costs of Open Learning: A Handbook*, Oldenburg, Bibliothecks-und Informationssystem der Carl von Ossietsky Universität Oldenburg, p.14.

[37] Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona, pp. 13-14. The cheapest option, at US$6000, involved the presentation of course outlines and assignments; more expensive options included the provision of text ($12,000), text with reference materials ($18,000), with images ($37,500), with audio and video ($120,000), with simulations ($250,000), and with virtual reality ($1,000,000).

[38] Whalen, T. and Wright, D (1999) Methodology for Cost-benefit analysis of web-based tele-learning: Case Study of the Bell Online Institute, *American Journal of Distance Education* 13 (1), 24-44, p. 32.

Cost of developing a three unit internet course (US$)
(Arizona Learning Systems, 1998)

Course outlines and assignments	6,000
Text	12,000
Text with reference material	18,000
Text with reference material and images	37,500
Audio and video	120,000
Simulations	250,000
Virtual Reality	1,000,000

As I mentioned, a fairly high proportion of the costs of developing materials are labour costs. They can be reduced or at least kept in check by adopting cheaper approaches to course development based on an editor working with a consultant author, instead of hiring permanent staff – and this surely is the route many commercial providers are likely to take. But even if for-profit organisations do not go down this route, and continue to hire academics on contracts of service, it seems likely that many will not wish to support a research function. Such organisations may not attract the best teaching staff, but their costs will come down markedly. With commercial competitors going down these routes, you can bet that public sector institutions will follow.

Although the development costs of even relatively simple online materials may be higher than paper-based print, and even much higher depending on the media mix one uses, it seems fairly clear that there are considerable institutional savings on delivery costs. The Library of Virginia has digitalised the state's colonial records. This has drastically reduced the costs of fulfilling requests from readers. The costs to the library of providing a single copy of a four page report in digital format is just 90 US cents, compared with $19 to supply a surface-mail customer, and $12 to supply an on-site user[39]. Applied to course materials, online delivery to order could cut inventory, packing, and postage costs enormously. Online library services like those offered or under development by XanEdu and Questia are likely to be invaluable – provided the subscription rates are not unreasonably high. However, students used to their course materials plopping through their letterboxes are likely to see their study costs rise as they access materials online and print them off themselves.

(ii) The costs of online communication

What about the costs of computer-mediated communications? Here we get into the costs of labour and the problems of student load. Bates has suggested that in comparison with face-to-face teaching, online education will lower the costs of tuition because a good deal of the students' time is spent studying the material, and so the teacher needs to spend less time per student overall in class[40]. Other analysts argue that students will also spend a great deal more time learning from their peers, and that this too will reduce the demands they make of their tutors. Certainly DiBiase, teaching for Penn State University's World Campus, found that he and his Teaching Assistant were spending less time supporting students on an online course (1.6 hours per student against 2.6 hours on a regular course)[41].

[39] Roderick, E (1998) 'More than just pretty pictures: A cost/benefit analysis of digital library holdings'. A paper presented to the CAUSE98 Conference, Seattle, December 1998, available at http://www.educause.edu/copyright.html   The costs were US$0.90 for digital delivery, against of US$18.56 to supply a surface-mail customer, and $12.15 to supply an on-site user.

[40] Bates, A. W. (2000) *Managing technological change. Strategies for college and university leaders*, San Francisco, Jossey-Bass Publishers, pp. 126-27: 'a good deal of the students' study time … is spent interacting with the pre-prepared multi-media material, so the teacher needs to spend less time per student overall moderating discussion forums compared with the total time spent in classroom teaching'.

[41] DiBiase, D. (2000) 'Is distance teaching more work or less?', *American Journal of Distance Education* 14 (3), 6-20, pp. 15-16

However, the general consensus seems to be that online tutoring adds to traditional faculty workload[42] given the enormous volume of messaging[43] arising from increased interaction with students[44], with each message requiring more time to compose than is the case in verbal interactions[45]. Moonen thinks that the increased load would be of the order of 5 to 10 hours a week for a class of 60 to 120 students[46]. Jewett thinks tutors could well spend twice as much time tutoring on-line as they do face-to-face[47]. This raises the question of how many students an online instructor can handle. In classroom courses in the USA it looks as if people think they can handle from 25 to 30 students, working perhaps 10 to 12 hours a week. Boettcher suggests that experience indicates that a member of faculty can handle more students on a web course – in the range 25 to 65, but that this will require more time – so that although there are courses with 50 – 60 students on them, there are many courses where student numbers are deliberately kept down, somewhere in the range of from 12 to 20 students[48].

One way of coping with an academic's increased work load is to hire more staff but this, of course, costs more. However, the impact on labour costs can be reduced through 'labour-for-labour' substitution – that is, the substitution of cheap labour for expensive faculty labour. This cheap labour might be students[49], teaching assistants, or clerks covering help desks[50]. These options are much discussed in the US literature. However, hiring cheaper labour is not possible in small classes run by just one academic; it only works in large classes[51]. Also, labour-for-labour substitution has its critics. Traditionally PhD students have helped teach courses but student labour is not the cheapest labour on offer. Adjunct staff hired by the class is even less expensive – so much so that there is concern that their employment could damage graduate programmes by reducing the employment opportunities for PhD students[52].

Up to now I have been talking about the impact of CMC on the costs of traditional institutions. What about its impact on the costs of distance education delivery? Firstly, there is evidence that tutors spend more time moderating and tutoring e-courses. Tolley, drawing on her experience as an Open University tutor, found that she spent more than twice as many hours tutoring the on-line version of *What is*

[42] Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona, p.20; Arvan, L., Ory, J. C., Bullock, C. D., Burnaska, K. K., and Hanson, M. (1998) 'The SCALE Efficiency Projects', *Journal of Asynchronous Learning Networks*, 2 (2). Available at http://www.aln.org/alnweb/journal/vol2_issue2/arvan2.htm

[43] Moonen, J. (1997) 'The efficiency of telelearning', *Journal of Asynchronous Networked Learning*, 1 (2). Available at http://www.aln.org/alnweb/journal/issue2/moonen.htm

[44] Jewitt, F. (1999) *A Framework for the comparative analysis of the costs of classroom instruction vìs-a-vìs distributed instruction*. Study undertaken for the New Jersey Institute for Collegiate Teaching and Learning. California State University, March 1999, p. 37.

[45] Inglis, A. (1999) 'Is online delivery less costly than print and is it meaningful to ask?', *Distance Education*, 20 (2), 220-39, p.223.

[46] Moonen, J. (1997) 'The efficiency of telelearning', *Journal of Asynchronous Networked Learning*, 1 (2). Available at http://www.aln.org/alnweb/journal/issue2/moonen.htm

[47] Jewitt, F. (1999) *A Framework for the comparative analysis of the costs of classroom instruction vìs-a-vìs distributed instruction*. Study undertaken for the New Jersey Institute for Collegiate Teaching and Learning. California State University, March 1999, p. 41.

[48] Boettcher, J. V. (1999) *How many students are just right in a web course?* Available at http://www.cren.net/~jboettch/number.htm

[49] Arvan, L., Ory, J. C., Bullock, C. D., Burnaska, K. K., and Hanson, M. (1998) 'The SCALE Efficiency Projects', *Journal of Asynchronous Learning Networks*, 2 (2). Available at http://www.aln.org/alnweb/journal/vol2_issue2/arvan2.htm

[50] Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona, p.24.

[51] Arvan, L., Ory, J. C., Bullock, C. D., Burnaska, K. K., and Hanson, M. (1998) 'The SCALE Efficiency Projects', *Journal of Asynchronous Learning Networks*, 2 (2). Available at http://www.aln.org/alnweb/journal/vol2_issue2/arvan2.htm

[52] Turoff, M. (1998) 'Alternative futures for distance learning: The Force and the Darkside', *Online Journal of Distance Learning Administration* 1 (1). Available at http://www.westga.edu/~distance/turoff11.html

Europe? as she did the 'traditional' version – 120 hours against 48[53]. She was not paid for the additional work, which also had a dramatic effect on her 'phone bill. Annand, from his perspective at Athabasca University, suggests that it is these costs that may in the end constrain the extent to which large-scale distance teaching universities can adopt on-line technologies[54]. Some institutions are trying to find ways of containing demands on tutor time by controlling student expectations and limiting the time for engagement on a particular topic; others, like the e-University, seem to be talking about putting the task of tutoring out to commercial ventures like Tutor.com, which will charge students for use[55].

Secondly, there is the costs of reception. Cost analysis tends to be bounded by the institutional budget. The costs students incur in acquiring and operating equipment is not generally taken into account – yet from the would-be student's point of view, these costs can have a major impact on affordability, and hence on access. In the USA the distribution of computers is highly graduated by income, race/ethnicity, and educational attainment[56]. If owning the equipment is a necessary condition for participation, then expect to see more disadvantaged people being excluded on cost grounds.

Local centres may, of course, mitigate student costs by providing access to machines, but they cost a fair amount in rent, equipment, furniture and staffing to set up – and generally accommodate very few students at any one time. This is not a solution to mass access – which is why the African Virtual University is such a limited project. Internet cafés cost money to use and are not necessarily ideal environments for study. In any case, in a country like Uganda, anything that uses a telephone line is extremely expensive.

(iii) The costs of e-administration

We know very little about the costs of e-administration, but on the whole this may be the area where savings are most likely to occur. Service costs in a range of industries are being brought down as institutions invert traditional processes, such as student services, to focus more on Web-based, self-service models [57]. A paper-based order costs about $65 to fulfil – but it only costs around $5 to fulfil an online order[58]. A paper-based invoice may cost US$0.90 to produce and distribute; online services can reduce this to something like $0.40 - $0.60[59], and speed the whole process up. Perhaps 75% to 90% of transactions currently done manually and on paper should be done electronically [60]. This trend will impact on all educational institutions, including ODL ones.

[53] Tolley, S. (2000) 'How electronic conferencing affects the way we teach', *Open Learning*, 15 (3), 253-65, p 263.
[54] Annand, D. (1999) 'The problem of computer conferencing for distance-based universities', *Open Learning*, 14 (3), 47-52, p. 20.
[55] PricewaterhouseCoopers (2000) *Business model for the e-University*, Main report, paragraphs 79-80, available through through http://www.hefce.ac.uk/pubs/HEFCE/2000/00_44.htm
[56] Gladieux, L. E. and Swail, W. S. (1999) 'The Internet: New engine of inequality?' Paper presented to the EDUCAUSE'99 Conference. Available at http://www.educause.edu/ir/library/html In the USA, three out of four households with incomes over $75,000 have a computer, but only one in three of households with incomes between $25,000 and $35,000, and one in six of those with incomes under $15,000. White households are twice as likely as black or Hispanic households to have access to a computer. Graduates are four times as likely to have online services as those with only high school education.
[57] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 17.
[58] Naughton, J. (2000) 'Much more than a bubble', *The Observer*, 31 December 2000, p. 23.
[59] PwC (1998) *Technology Forecast: 1999*. Menlo Poark, CA, PricewaterhouseCoopers Technology Center.
[60] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 17.

E-commerce practices are also invading education to provide income streams. Many US campuses are now allowing advertising on their web-sites – with the income from advertising offsetting the cost of the site[61]. Some universities – such as Georgetown University – have auctioned spare course capacity on the Internet, with bidders hoping, of course, to get a place on an expensive course at a discount[62]. We can expect eduCommerce to proliferate[63]. Certainly the e-University Business Model assumes that this kind of activity will occur[64].

(c) Comparing the costs of online education with other forms of education

Having looked at the costs of the media/technology, let us look at how the costs of e-education courses compare firstly with those of class-based education, and secondly with other forms of distance education.

(i) Comparing e-education costs with the costs of face-to-face education

Whether one system is more or less expensive than another will depend upon a range of factors such as those I discussed earlier. One approach is to substitute CMC for classroom teaching – leaving everything else unchanged. A study conducted at the University of Illinois found that unit costs came down on all nine courses in which asynchronous learning networks were substituted for face-to-face instruction[65]. Bates also thinks that online university courses using just CMC, and involving no real e-materials development, will be cheaper than face-to-face courses[66]. However, most online courses involve some materials, so that cost-efficiency depends on the number of students enrolled. Bates suggests that a standard Web-based course, with a mix of pre-prepared Web materials, on-line discussion forums, and print in the form of required texts, is increasingly more cost-effective than face-to-face teaching as numbers per class increase beyond 40 per year over a four-year period. Under 20 students, it is not economically worth doing. Between 20 and 40 students per year per course, any cost differences are likely to be less significant than differences in benefits[67].

If we widen the argument to take into account training costs that fall on employers, then we find that there are stronger reasons to believe in savings. There is general agreement that online training courses are less expensive that face-to-face ones provided the development costs are spread across sufficient numbers of students (possibly over several years), and provided that one takes into account both

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[61] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 15.

[62] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 15.

[63] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 15.

[64] PricewaterhouseCoopers (2000) *Business model for the e-University*, Main report, paragraphs 194-195: available through http://www.hefce.ac.uk/pubs/HEFCE/2000/00_44.htm

[65] Arvan, L., Ory, J. C., Bullock, C. D., Burnaska, K. K., and Hanson, M. (1998) 'The SCALE Efficiency Projects', *Journal of Asynchronous Learning Networks*, 2 (2). Available at http://www.aln.org/alnweb/journal/vol2_issue2/arvan2.htm

[66] Bates, A. W. (2000) *Managing Technological Change. Strategies for College and University Leaders*, San Francisco, Jossey-Bass Publishers, pp. 126-27.

[67] Bates, A. W. (2000) *Managing Technological Change. Strategies for College and University Leaders*, San Francisco, Jossey-Bass Publishers, pp. 128-9. 'We are fairly confident that a standard Web-based course, with a mix of pre-prepared Web materials, on-line discussion forums, and print in the form of required texts, becomes increasingly more cost-effective than face-to-face teaching as numbers per class increase beyond forty per year over a four-year period. This assumes that interaction between students and teachers remain high. Conversely, we tend to avoid developing distributed learning courses for fewer than twenty students per year. Between twenty and forty students per year per course, any cost differences are likely to be less significant than differences in benefits.'

savings on travel and accommodation costs, and the fact that less of an employee's productive time is lost (employees now train in their own time rather than in the firm's time)[68].

However, things don't look so good once purpose-built materials are added in: Bates says that if as well as having CMC, one also develops purpose-built materials, then the unit costs will be more expensive than face-to-face tuition[69]. Arizona Learning Systems found that the cost per course enrolment of an 'average' Internet course (US$571) is higher than that of traditional classroom instruction ($474), though labour-for-labour substitution might bring this down to $447[70]. However, much depends on the nature of the materials and their associated development costs which, as we saw, they estimated to vary from US$6000 to $1,000,000 for a three unit Internet course[71].

(ii) Comparing e-education costs with the costs of other forms of distance education

What about the cost comparison with other forms of distance education? We have very few studies go on. In an Australian study, Inglis found the online version of a course was less cost efficient at all levels of enrolment than a print-based distance education course[72]. Elsewhere, Jung compared the costs of presenting standard three credit courses at the Korea National Open University. The course involving textbooks, CD-ROM and electronic tuition was more expensive than the courses using either textbooks, radio and face-to-face tuition, or those using textbooks, television and face-to-face tuition. However, dropout was only 10% on the e-course, compared with 60% on the other two types[73].

Average cost per student of print and online versions of a course
Source: Inglis (1999: 231)

	Average cost per student: 1999 Aus$	
Volume of students	Print version	Online
50	169.84	217.71
100	125.38	171.63
150	110.56	156.27
200	103.15	148.59

Costs of distance education at the Korea National Open University

Source: Jung (2000: 229)

	TV-based course	Radio-based course	Web-based course

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[68] Ravet, S. and Layte, M. (1997) *Technology-based Training. A Comprehensive Guide to Choosing, Implementing, Managing and Developing New Technologies in Training*, London, Kogan Page., pp. 143-2; Phelps, R. H., Wells, R. A., Ashworth jr., R. L., & Hahn, H. A. (1991) 'Effectiveness and costs of distance education using computer-mediated communication', *The American Journal of Distance Education* 5 (3), 7-19, pp. 12-14; Whalen, T. and Wright, D (1998) *Cost-benefit analysis of web-based tele-learning: Case study of the Bell Online Institute Pilot Project*, University of Ottawa, Faculty of Administration, July 1998, p. 40

[69] Bates, A. W. (2000) *Managing technological change. Strategies for college and university leaders*, San Francisco, Jossey-Bass Publishers, p.128.

[70] Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona, p.24.

[71] Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona, pp. 13-14.

[72] Inglis, A. (1999) 'Is online delivery less costly than print and is it meaningful to ask?', *Distance Education*, 20 (2), 220-39, p. 233.

[73] Jung, I. (2000) 'Technology innovations and the development of distance education: Korean experience', *Open Learning* 15 (3), 217-32, pp. 228-9.

Rating	16 week, 3 credit	16 week, 3 credit	16 week, 3 credit
Media	Textbook, TV programmes and face-to-face tuition	Textbook, radio programmes and face-to-face tuition	Textbook, video- and audio-clips, electronic tuition
Number of students	1000	1000	30
Cost to produce and deliver US$	80000	35000	13000
Cost per student US$	80	35	434
Drop-out rate (%)	60	60	10
Cost per completed student US$	200	87.5	482

Summarising progress to date

Before we jump to any conclusions about the relative costs of e-education, traditional education, and other forms of distance education, there are some caveats to make.

- None of the studies factor in the costs of overheads.

- Generally operating budgets don't reflect the full costs of maintaining networked services[74]. Cost studies based on such budgets don't do this either. This is something that the US COSTS project is tackling[75]. However, the costs of putting in equipment directly associated with the projects (e.g., servers) are usually taken into account, as are the costs of software licenses.

- In the cost studies, equipment is generally annualised over five years[76], but in the US in 1998/99 the typical replacement cycle for computers was 3 to 5 years; for central servers 3 to 4 years; and for network electronics, 5 to 6 years[77]. This may seem like insignificant detail – but it impacts on costs significantly, and even more so when the opportunity cost of capital is taken into account.

- Finally, any tentative conclusions one might wish to draw are complicated by the fact that nobody yet seems to know what constitutes a reasonable online workload for academic staff.

Nevertheless, let me try to summarise where I think we are on costs. For the institution, there is evidence that delivering content online is driving costs up. There is mixed evidence about the costs of online tutoring though I tend to believe that suggestions that this is leading to savings are illusory – and will be shown to be so when tutors begin to demand to be paid for the hours they put in, or have their student numbers capped, or walk away from the job. I also suspect that there are significant administrative savings to be made and that these will, in the end, pay for the increased costs of teaching online. Linked eduCommerce activities may also generate income to offset some of the costs. Against this, though, there is the unknown burden of overheads, which analysts like to ignore.

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[74] Leach, K. and Smallen, D. (1998) 'What do Information Technology support services really cost?', CAUSE/EFFECT 21 (2), 38-45. Available at http://www.educause.edu/ir/library/html

[75] Leach, K. and Smallen, D. (1998) 'What do Information Technology support services really cost?', CAUSE/EFFECT 21 (2), 38-45. Available at http://www.educause.edu/ir/library/html; Leach, K. and Smallen, D. (2000) 'What do we really understand about the cost of IT support services?' Presentation to the EDUCAUSE 2000 Conference. Available at http://www.costproject.org/

[76] e.g. Arizona Learning Systems (1998) *Preliminary cost methodology for distance learning*, Arizona Learning Systems and the State Board of Directors for Community Colleges of Arizona; Whalen, T. and Wright, D (1998) *Cost-benefit analysis of web-based tele-learning: Case study of the Bell Online Institute Pilot Project*, University of Ottawa, Faculty of Administration, July 1998.

[77] Leach, K. and Smallen, D. (2000) 'What do we really understand about the cost of IT support services?' - Presentation to the EDUCAUSE 2000 Conference. Available at http://www.costproject.org/

As far as students are concerned, they will have to provide their own equipment and fund their own use of the web. Students will also have to pay for many of the services they use either on a subscription basis, or as they use them. The e-University Business Report makes it clear that students will have to pay for library access offered by firms such as XanEdu, and for tutorial and guidance support[78]. No doubt the costs of the technology will come down, but those who are not able to afford e-education are being written out of the game. This is true within developed countries, at least in respect of some sectors of the population, but much more widely the case in developing countries[79].

Structural changes

One of the themes of this lecture is that technological change can facilitate structural changes to make savings. It is impossible to predict exactly how much impact e-education will have on educational structures, but I think we can begin to make some educated guesses.

IT and e-business make it possible for the value chain to be broken up, so that instead of a single integrated firm[80], we get a number of specialist organisations and individuals operating within a 'value net' to provide services at lower cost[81]. We have seen this happen in the OU with the outsourcing of a number of functions – if not in whole, then at least in part. Disaggregation of this kind finds enormous favour in the e-University report, where it is suggested that courses will be provided by a range of institutions; subsidiary operating companies will both develop and deliver materials and services; organisations like SmartForce and Tutor.com might provide tutorial support for those not content with online interactive tutorial support; organisations like Questia and XanEdu will provide online library facilities; and examining bodies will award qualifications[82]. A fair amount of this disaggregation is aimed not at drawing in the best, but at driving down the cost.

Partnership models are also currently popular, as evidenced by Scottish Knowledge[83], Universitas 21[84], UNEXT.com[85], the American Education Consortium[86], and the National Universities Degree

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[78] PricewaterhouseCoopers (2000) *Business model for the e-University*, Main report, which mentions the aspects of the service that students may have to pay for as they use them: paragraphs 79-80 (commercial tutors), 87-89 (online libraries), 91-99 (awards); 107 (advisors – i.e. 'navigators') : Report available through http://www.hefce.ac.uk/pubs/HEFCE/2000/00_44.htm

[79] Perraton, H. (2000) *Open and Distance Learning in the Developing World*, London, Routledge, p. 150.

[80] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, pp. 12-13.

[81] Oblinger, D. (2001) 'Will e-business shape the future of open and distance learning?', *Open Learning* 16 (1), 9-24, p. 14.

[82] PricewaterhouseCoopers (2000) *Business model for the e-University*, Main report, paragraphs 79-80 (commercial tutors), 87-89 (online libraries), 91-99 (awarding bodies), 149 (role of subsidiary operating companies): available through http://www.hefce.ac.uk/pubs/HEFCE/2000/00_44.htm

[83] Scottish Knowledge is a global higher education consortium that brings together Scotland's 14 universities, Edith Cowan University in Australia, and other providers, plus News International plc.

[84] This is a consortium led by the University of Melbourne, which plans to establish itself as a global player in international distance education.

[85] Illinois-based Internet university UNEXT.com and its newly-created Cardean University which is partnering with leading academic institutions such as Columbia Business School, Stanford University, University of Chicago Graduate School of Business, Carnegie Mellon University, the London School of Economics and Political Science, and other high-profile universities to sell business-oriented online MBA courses to multinational and overseas corporations

[86] The American Education Consortium (ADEC) with sixty institutional and affiliate members sharing in providing specialised courses and programmes, internationalising their offerings and purchasing expensive satellite time – c.f. Poley, J. (in press) 'The American Distance Education Consortium: From rural provision to virtual organization' in C. Latchem and D. Hanna (eds.) *Leadership and Management in Open and Flexible Learning,* London: Kogan Page.

Consortium[87]. Partnerships are fragile entities, though I am sure that they can work where partners bring something concrete to the partnership, in the form of intellectual capital and reputation. However, partnerships built around something as fragile as the e-University with its offer of an administrative platform seem to me to be really fragile because, in the end, I suspect that any half-competent provider is going to ask why they need a middleman.

My money is on big universities created by growth and mergers. Coase's theory of transaction costs within the firm[88] supports the case that, whenever it is cheaper to do things within a larger organisation, rather than in a smaller organisation or as an individual, organisations will grow bigger[89]. Of the 100 biggest economic entities in the world, 48 are countries, and 52 are multi-nationals[90]. Currently, mergers are the order of the day, and it is often big companies that are merging with each other. *The Economist* celebrated the BP-Amoco merger with the headline 'Big Oil is Dead. Long Live Enormous Oil'[91]. 'Third wave' information sector businesses are as prone to mergers as any other[92]. Scale could also be important in higher education. One recent book cites John Daniel's *Mega-universities and Knowledge Media* as evidence of the search for scale in the university sector[93], and mergers are an obvious way to move this process forward. Indeed, companies from other industries – including publishing – are using mergers and acquisitions to enter the education and training market[94]. Having said that, I do not discount small-scale operations either – a point I made in an article[95] written some three years ago where I argued that just as the origins of universities lay in the twelfth century development of an intellectual class whose profession was 'to think and share their thoughts'[96], and who initially operated in 'workshops out of which ideas, like merchandise, were exported'[97], and who were paid directly by their customers (a practice that continued at the University of Bologna where academics were paid by the students who attended their lectures), so there will be those modern academics who use the internet to set themselves up as the contemporary equivalent of the twelfth century knowledge artisan. The problems such global, internet-based knowledge artisans will face are twofold – getting known, and getting validation so that their courses can caount towards some kind of recognised qualification. In my article I suggested how loosely federated groups of academics, operating in the manner of a law chamber, might work together in a post-bureaucratic organisational structure[98]. That such organisations are possible and exist, however, does not take away from the fact that the advantage lies with bigness.

Whatever the outcome – disaggregation, partnerships, or mergers – the prime motivation is to survive in a competitive world, and competition is going to increase. With an Internet education market that was worth US$200 million in 1997 expected to be worth over $7 billion in 2002, it is not surprising

[87] The National Universities Degree Consortium (NUDC) which enables 11 accredited US universities to collaborate in offering well over 1,000 certificate, baccalaureate degree and graduate degree programmes, and facilitates substantial cooperation in marketing and student support.

[88] Coase, R. H. (1937) 'The nature of the firm', *Economica NS*, 4 (16), 386-405.

[89] Downes, L. and Mui, C. (1998) *Unleashing the Killer App: Digital Strategies for Market Dominance*, Boston, Harvard Business School Press.

[90] Elliott, L. (2001) 'Novelists tell fact fom fiction', *The Guardian*, January 15 2001, p. 23.

[91] *The Economist*, 13 December 1997. Cited in Brown, J. S. and Duguid, P. (2000) *The Social Life of Information*, Boston, Mass., Harvard Business School Press, p. 24.

[92] Brown, J. S. and Duguid, P. (2000) *The Social Life of Information*, Boston, Mass., Harvard Business School Press, p. 25.

[93] Brown, J. S. and Duguid, P. (2000) *The Social Life of Information*, Boston, Mass., Harvard Business School Press, p. 25.

[94] See Moe, M., Bailey, K. and Lau, R. (1999) *The Book of Knowledge: Investing in the Growing Education and Training Industry*, San Francisco, Merrill Lynch.

[95] Rumble, G. (1998) 'Academic work in the Information Age: a speculative essay', *Journal of Information Technology in Teacher Education*, 7 (2), pp. 129-45.

[96] Le Goff, J. (1993) *Intellectuals in the Middle Ages*, Blackwell, Oxford, p. 1.

[97] Le Goff, J. (1993) *Intellectuals in the Middle Ages*, Blackwell, Oxford, p. 62.

[98] C.f. Heckscher, C. (1994) 'Defining the post-bureaucratic type', in Heckscher, C. and Donnellon, A. (eds.) *The Post-Bureaucratic Organization: New Perspectives on Organizational Change*, Thousand Oaks, Sage Publications.

that people see this as a sector for investment[99]. The new entrants to the game – whether they are new partnerships, corporate universities operating as profit centres, for-profit educational institutions, or virtual universities, will provide existing ODL providers, including publicly-funded ones such as the Open University, with stiff competition[100]. There will be plenty of scope for comparative shopping – something that the net facilitates enormously. As cost, convenience, quality and reputation come to drive students' decisions, so comparative shopping will become more and more important. In this game organisations with high costs could lose out, especially if they are not among the top global brand names.

The drive to reduce costs in order to compete will also lead to internal changes – many driven by the need to cut costs in the face of competition. I draw these together in my conclusions.

Conclusions

A Canadian scientist, Ursula Franklin, wisely observed: 'Whenever someone talks to you about the benefits and costs of a particular project, don't ask 'What benefits?', ask *'Whose* benefits and *whose* costs?'* At times it helps to rephrase an observation in line with a perspective from the receiving end of technology'[101].

In conclusion, then, I want to address Franklin's questions – whose benefits, and whose costs? David Noble, currently perhaps the most vehement critic of distance education, is wrong to see the battle lines solely in terms of a struggle between 'on the one side university administrations and their myriad commercial partners, on the other those who constitute the core relation of education: students and teachers'[102]. For some academics, online education has opened up all sorts of exciting possibilities to do research, publish, go to conferences, establish reputations, and so on – and I do not blame colleagues for making the most of these opportunities. Things have not been this good since the heady days of the last great technological leap forward to influence our field – Educational Television – and there are those who quite legitimately are on the roll.

For those who develop the materials, the situation is mixed. Many will find the art of designing multi-media courses for delivery over the Web an exhilarating challenge. Others, working in traditional institutions where they are also required to deliver face-to-face classes, may feel that there is more than a hint of exploitation. Personally I think that academics working on the course development side of the business are particularly vulnerable to the erosion of their current contractual benefits, and to labour-for-labour substitution as consultant authors replace permanent staff. It is not surprising that Noble sees the 'spectre of faculty resistance' stalking the land[103].

What of the academics who teach on-line? It all depends where one comes from. If one already teaches in a campus environment, then teaching online will almost certainly add to one's working hours, unless, of course, student loads are reduced. However, the introduction of distance teaching methods into a campus setting is also likely to accelerate the tendency to divide labour between those who develop materials and those who teach. The latter in particular are likely to be hired on a casual basis. For some academics, the costs will show up in the degradation of their jobs, in increased insecurity, even in loss of permanent status. Changes in an industry have always resulted in changes that affect labour, and the present case is no exception.

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[99] Giegerich, A. (2000) 'Corporate strategies: the benefits of education', *Business Journal of Portland Online*, 27 March, available at http://www.bizjournals.com/portland/

[100] See Rumble, G. and Latchem, C. 'Organisational models for distance and open learning', in Perraton, H. and Lentell, H. (Eds.) *World Review of Distance Education and Open Learning, Volume 3*, London, Routlege/Commonwealth of Learning, in preparation, for a review of these newer organisational models.

[101] Franklin, U. (1992) *The Real World of Technology*, Concord, Ontario, House of Anani Press Ltd., p. 124.

[102] David Noble (1997) *Digital Diploma Mills, Part I: The automation of higher education*, available at http://communication.ucsd.edu/dl/ddm1.html

[103] David Noble (1997) *Digital Diploma Mills, Part I: The automation of higher education*, available at http://communication.ucsd.edu/dl/ddm1.html

For those who already teach in a distance education setting, the real problem is one of increased workload. Of course, teaching online can be exhilarating but how about paying tutors for their additional work?

I have suggested that e-education is pushing costs up. There is little doubt that online teaching is more expensive than print and audio-based forms of distance education, while the savings on-campus – if any – seem to me to result more from the degradation of academic labour than from anything else. However, if we broaden the definition of online teaching to encompass a fully fledged e-education system, then there are savings to be achieved, both within campus-based and within existing distance teaching institutions. These savings will be made in administration. E-business practices should bring down the costs of administering education. This will only happen in existing institutions, of course, if managers are prepared to make structural changes. However, new entrants, operating without prior constraints, will force the pace of competition, making structural change in existing distance providers such as the Open University – and in traditional universities – inevitable. Layoffs, labour for labour substitution, and degradation of work will follow. Just as an example, in my view the whole push for devolved admissions, student records, and advisory systems based in regional centres, which so preoccupied OU regional staff in the 1990s, has been overtaken by the march of technology: the processes should be online and on-telephone. Savings here are needed so that we can afford CMC within the e-education package offered by the OU.

This does not mean that some individuals will not make a virtue of, and indeed flourish, as freelance, portfolio workers – authoring for, designing, editing, and tutoring for, organisations such as the Open University, the National Extension college, and the e-University, but many others will, I suspect, loose out as they are shed from the permanent staff of changing bureaucratic organisations.

Let me move away from the people to the institutions themselves. E-education is here to stay. Half-baked dot.coms may have gone to the wall, but e-education is in my view an assured 'killer-app', just as much as the Web is a transformative technology. From an institutional point of view, e-education is a game distance educators can not avoid, and the game is about organisational survival. It is possible, of course, to survive as a small fish, but it will be easier to do so if one is big, where economies of scope come into play. To be big, organisations should think about mergers. These may embrace other educational organisations. They should embrace organisations in associated industries – for example, publishers and media groups. Venture capital is worth going for. Reputation will be a key asset. Educational organisations with strong international brand names will be powerful competitors. Mergers designed to protect or enhance the brand will be important. Strategic partnerships are less robust, which is why I think the e-University has a problem.

What about the students? Their studies will potentially be enriched. However, because online teaching pushes up the costs of distance education, and because these additional costs will be passed on to students, this will make access more difficult for some. Nevertheless, e-education is going to grow, partly because it meets some customer/student expectations for convenience, and partly because, in its fully-fledged form, it has pedagogic advantages over other forms of distance education.

Nevertheless, finding a satisfactory answer to Franklin's question seems a lot harder now as societies and nations fracture across ever widening gaps in wealth. The Open University was born with a highly developed sense that it was committed to ironing out some of the inequalities that resulted from an elite educational system. It led the way towards mass education in this country, and it exported its system in the belief that this would help developing countries expand their education systems. Given where we are, the Open University may well not have a choice in what it does, but increasingly I think that the choices it is being forced to make are at the expense of the ideals that led to its birth. That may not be a price too high for survival and development, but it is a significant cost.