

CHAPTER 3

THE IMPACT OF ICT ON LIFELONG LEARNING

Mary Thorpe

CHAPTER SUMMARY

Information and communication technologies (ICTs) have been an integral element in the growth of diverse forms of open, online and distance education, which over the last 40 years, have brought new opportunities for lifelong learning in many countries. Delivery of resources, however, does not guarantee learning, even when the initial barriers of access have been overcome. Where the media in use are unfamiliar, even stronger incentives are required for learners to engage effectively. In the case of the UK Open University, assessment plays a strong role in focusing learner attention on opportunities such as Internet resources and computer conferencing. What is also clear is that the effectiveness of ICT depends on course designers and authors understanding what it can deliver and having resources to ensure that a high quality experience is on offer to the learner. Poor take-up may often reflect an inappropriate or low quality offering, rather than a rejection of technology per se. Examples of successful use can demonstrate what is achievable and the potential of ICT to transform learner experience and capabilities. Individual teachers are unlikely to be able to achieve at this level, without an institutional context that incorporates resources, training and appropriate policies for both learner support and materials development.

INTRODUCTION

The impact of ICT on learning is currently discussed almost entirely in relation to use of digital media, primarily the World Wide Web. However, ICT impacted on higher education before the widespread use of the Internet. Through the application of print, audio-visual and broadcast media to distance education, it has enabled those with adult roles and responsibilities to continue formal study leading to higher education qualifications on a mass scale. The practice of lifelong learning itself has been facilitated by the demonstrable fact of thousands (now millions worldwide) of adults studying beyond school age using a range of media, and pursuing both occupational and leisure

goals (Daniel, 1996). Lifelong learning has been an inspirational concept for decades, receiving attention now for a variety of economic and social development reasons. In practice, it is dominated by provision of learning opportunities for adults and research into the effects and significance of learning beyond formal schooling. Nevertheless, we should not lose sight of the lifelong trajectory and Dave's 1976 definition provides a succinct reminder of that, directly relevant to the substance of this chapter; he defines lifelong learning as:

“A process of accomplishing personal, social and professional development throughout the life-span of individuals in order to enhance the quality of life of both individuals and their collectives.” (Dave, 1976, quoted in Rausch, 2003)

Since the mid-1990s, the Open University UK has adopted a strategy of investment in digital media, building on early use of the Internet for computer mediated communication, on a large scale from 1988 (Mason and Kaye, 1989). These early applications showed that use of e-mail and conferencing could revolutionise the potential of distance teaching by opening up communication across the student body, as well as between the tutor, course team and students. They also showed that impact on students was very varied, typically leaving one third who hardly ever participated, one third who did so to an acceptable level, and one third who became enthusiasts and participated well beyond the requirement set down by the course team.

Summarising the promise of the “new media” – taking these to include CD-ROM and now DVD-ROM as well as the Web and applications such as streaming audio¹, video and mobile devices – commentators have typically identified the following advantages:

- A sense of presence, possibly even community, in online interaction
- Improved learner support
- Unlimited practice of difficult concepts, skills etc.
- Unlimited access to resources via the Internet
- Improved delivery of learner preferences – notably those required by students with disabilities
- Global access to resources and teaching
- Learning anywhere, any time

What we now have is accumulated experience over more than a decade of large-scale use at the Open University and elsewhere that demonstrates three major themes. The first is that the impact of the new media is uneven, whether resulting from differences between learners, the context in which learners are studying, or the nature of the subject being learned. The second is that the promise of the new media is just that – a promise or potential that can only be realised through skilled and creative design and teaching, on the part of both the local tutor and the course team. The third is that lack of success in use of ICT may result as much from cultural differences in how people expect to learn, as from any feature of the new media themselves.

UNEVEN IMPACT: THE INFLUENCE OF CONTEXT

Prior to the widespread use of the Web, print was the main medium for teaching in distance education and many lifelong learning opportunities. Great ingenuity and specialist expertise has developed in using print, with both teachers and taught having shared an intuitive understanding of how print can be made to work effectively for

teaching and learning. Comparable shared understanding of how best to use e-learning has not yet developed, where e-learning refers to electronic delivery of resources and communication, both on and offline. While print is still the main carrier of teaching material at the Open University, all courses use Web sites and e-mail for some aspects of communication and teaching, most use digital resources and some are delivered and supported entirely online.

However, student evaluation shows a wide range of take-up and appreciation of the new media of conferencing, e-mail, Web sites and electronic resources via library databases and the Internet. An annual survey of new and other courses shows that OU students in different faculties experience more or less use of these media in their courses, and vary in the degree to which they find them helpful. Science courses, for example, have always made good use of software supplied on CD and now DVDs, and over 40 per cent of their students rated such materials as very helpful in the 2003 survey. Science students, however, gave very low helpfulness ratings to audio CD whereas almost 60 per cent of language students rated them as very helpful, as did over 40 per cent in health and social care, arts and education – all faculties making effective use of audio for course-related teaching (see Rae, 2004 for elaboration of these findings).

Course Web sites are also used to access electronic resources, with growing use by course teams instead of print versions. Whereas only about 5 per cent of arts undergraduate students found these very helpful, 60 per cent of arts postgraduate students did so, reflecting the importance of key online collections for postgraduate research. Researchers have pursued this in relation to the effectiveness of Web sites, and identify usability as a key factor. However, usability is a multifaceted issue, originating in the human-computer interaction literature, but inseparable from pedagogy where the context is use of Web sites for learning. Preece has defined it thus: ‘software with good usability...is consistent, controllable, and predictable, making it pleasant and effective to use’ (Preece, 2000: 27). However, students may still not use even well-designed sites, if they are pressed for time and the core of the teaching material is provided elsewhere. Pedagogical usability needs to be part of the design from the beginning, and content experts need to work alongside designers to ensure that the Web site is integrated into the teaching design as a whole. (Kukulka-Hulme and Shield, 2004).

One of the most important aspects of any teaching design is assessment, and students can be made to engage with conferencing, or CD-ROM resources, by incorporating such activities into the marking scheme of assignments. Students who do not participate will thus lose marks. Students themselves have demanded such an approach, arguing that if the course team says it is so important to spend study time on these activities, they should incorporate them into the assessment of the course. However, it is still a challenge to create a course design that really works. Macdonald and Twining (2002) for example, describe a course that used activities to lead students’ learning, including conferencing, Internet searching and hands on use of Hypernote for constructing a knowledge map. The course, “Learning Matters: Challenges of the Information Age” was delivered to students in UK, Europe and Singapore, as part of degree studies. The course was designed to encourage students to be active learners, and to learn more by reflecting on their own experience of learning tasks set by the course, than by attending to the transmission of information in course texts.

Evaluation of the student response demonstrated areas where the course design could have been improved. A collaborative conferencing exercise had only limited success for example, because it was scheduled between two assignments that were close in time, so that many students ignored it in favour of doing their assignment. About half the tutors

reported that group activity had reduced steadily since course start, and only some tutors engaged in the kind of active facilitation of conferencing, that ensured their students did participate. Such tutors e-mailed individual students to encourage them, logged on regularly themselves and ensured that group composition was working (Macdonald and Twining, 2002: 610).

In another area, the development of skills using a hypermedia authoring tool was partially successful, but could have been improved had it been integrated into more than one assignment, giving students several opportunities for feedback. Most students did not use effectively the graded activities designed to help them learn how to use the software, and only got to grips with it properly when completing the last assignment. This assignment required them to use the authoring tool to write a hypertext essay, as an exercise in exploring course concepts and making them explicit. After the assignment, around two thirds of students said they felt confident in using the tool, but tutors reported that many assignments used a linear approach and showed little use of the divergent possibilities of hypertext. What students needed was a more incremental approach to the development of skills, fostered by spreading the activity across more than one assignment (Macdonald and Twining, op cit, p. 615).

REALISING THE PROMISE: DEVELOPING NEW SKILLS AND EXPERTISE

The introduction of new media requires in effect, a complete rethink and redesign of teaching systems and staff skills. However, deep institutional change rarely occurs overnight, and as a result, the success of early attempts to use new media has been patchy, in terms of student usage and feedback. Students may be unenthusiastic however because of poor implementation rather than intrinsic qualities of the media. Furthermore, each course has different opportunities arising from the nature of the discipline and the learning goals set for students.

Some courses positively require to be taught using the Web, and it becomes feasible for a strong case to be made to students that participation online is essential. One such course is “The Environmental Web”², an advanced undergraduate course about environmental issues and the skills required in becoming an environmental scientist. This is a field where international experts and academics use the Web extensively for research. The course design uses web-based activities to lead student learning, and requires around half the study time to be at the computer screen. Activities create graded exercises in searching, evaluating and using web resources, carrying out measurements and analyses, and uploading assignments to Web pages. Students are explicitly warned that extensive study at the computer is required, and from the beginning, they have to interact online with their tutor group in order to carry out some aspects of their assignments.

Student and tutor feedback shows an enthusiastic response to this approach, and the course has very high retention rates. Seventy-seven per cent of all students who start the course achieve a credit, compared with the average across all Science courses of 60 per cent. Students feel in touch with contemporary science and activities that are happening during their period of study. In their first few weeks of study for example, they take on the role of a representative of one of the members of the Association of Small Island States (AOSIS), finding data about ‘their’ island and negotiating within their group about how best to represent their interests at the UN. As the 2005 cohort begin their studies, they will undoubtedly experience the immediacy of these concerns, and the relevance of their course, in reflecting on the impact of the Tsunami that devastated so many Indian Ocean islands on 26 December 2004.

The only face-to-face tuition for the course is a day school which is scheduled several weeks after the start of the course, and after students have ‘met’ each other online, through their AOSIS role play in groups moderated by their tutor. Tutors nevertheless feel that they can often support students more effectively than previously, through being in touch week by week, and able to contact individuals very easily by means of e-mail.

While there is much praise from both students and tutors for this course and its approach, not all students are equally enthusiastic. Many find it time consuming. In spite of the extensive guidance provided, and the graded introduction to Internet searching, students still find that it takes them longer than they expect to find exactly what they are looking for. Also the course, as with many others that build in conferencing to achievement of learning outcomes, requires students to participate at particular points in time. The much acclaimed flexibility of ‘traditional’ distance teaching is reduced by this approach, as earlier studies have shown (Thorpe, 1998). On one hand, the learning advantages of participating in online debates and consensus reaching are achieved, while on the other, students (some at least) find it difficult to commit themselves to participate during the window of time when such activities are scheduled. While dialogue is asynchronous, the activity overall has to be time limited, and some students find that work and other pressures make it difficult to find time during those specific weeks. If they miss it, they cannot catch it up later, and may even have to lose marks since participation is built into the assignment and a proportion of marks awarded for taking part effectively. This strategy has the positive benefit of rewarding students for an activity that develops their skills and understanding of the issues of environmental science, and the disadvantages are of course unintended effects which impact on some students more than others.

CULTURAL EXPECTATIONS AND PREFERENCES

Use of the Internet has enabled institutions to register learners wherever they are based. However, technical accessibility may reveal more subtle cultural barriers against participation. When the Open University sought to open its courses to US students, it had to break down long courses into shorter modules, fitting with the US semester system, and also with the concept of regular instructional activity led by a tutor, on a weekly basis. Course materials may also include content that is too culturally specific, or even offensive in some contexts. Yet here technology may help with the challenge. Digitally stored course materials can be edited, inappropriate sections cut and new material added to suit the new context. This process is facilitated by the use of content management systems and course designs based on reusable learning objects. While definitions of a learning object vary (Mackintosh et al, 2005), the core idea is to construct material which is organised into defined chunks which make sense in their own right. Chunks can be selected and used again in new combinations with new material and connecting strategies. This requires course teams to rethink how best to provide an integrated experience for learners, and detailed negotiations may also be necessary to ensure that diverse cultural expectations can be accommodated (Thorpe et al, 2003).

However, even where national boundaries are not in play, learner preferences can have a negative impact. Business students, for example, have often been unenthusiastic about computer conferencing. Their feedback emphasises that they study with strong vocational goals in mind, and in some cases, do not want to study via a computer screen having been at work all day, using a computer. They and other students are also experienced in fitting study around other tasks, at times and places where access to a computer is not feasible – while commuting for instance. Courses which absolutely have to be done at the computer screen, are thus reintroducing a potential barrier for these students – until such time as mobile technology produces a solution even for this challenge.

NEW AREAS FOR DISTANCE EDUCATION: WORK-RELATED LEARNING

The OU is now seeing the development of new capabilities in what it can do, arising from use of digital media. Whereas the list of potential advantages can be envisaged as making more effective the existing model of distance teaching – or supported open learning as the OU prefers to call its model – we are now seeing radically new kinds of teaching emerge, particularly in work-related learning and skills development.

While OU students have always studied for a mixture of motives, including relevance of study to the student's job or career aspirations, since the 1990s, qualifications linked with professional accreditation and on-the-job development have been offered. These have been very much enabled by the feasibility of using computer mediated communication. Leach, for example, describes two programmes that developed very effective online learning communities for teachers involved in rather different work-related learning (Leach, 2002). The first was a pre-service teacher education programme leading to the award of a graduate teacher qualification, the Post Graduate Certificate of Education. The second was a continuing professional development programme for serving teachers and librarians, aimed at use of ICT for subject teaching, from primary through secondary levels. Participants on the second, The Learning Schools Programme (www.lsp.open.asc.uk) developed an action plan for their use of ICT in their chosen subject, and worked through self-assessment for the award of a certificate of completion.

Although both these programmes were different in terms of target audience, goals and mode of assessment, they used conferencing in similar ways, to provide an online support community, to stimulate discussion of resources provided elsewhere and to make links between the existing professional world of schools and education, and students' professional colleagues and community online. Such goals are now quite common in online study programmes, but the high usage and traffic levels of both programmes are evidence that very lively online discussions were achieved. During its first three years (2000-2003), the Learning Schools Programme achieved monthly traffic of around 10,000 users, with over 100,000 school professionals involved, crossing both sectors and all subjects.

While such developments are not entirely the product of ICT, enhanced communications and the immediacy and resource-rich features of Internet usage, enable the University to teach and assess professional skills, where dialogue between students and experts is particularly important and up-to-date content relevant to the cultural context is vital. The OU has developed a national reputation for its teacher training, and demonstrated that it offers some advantages even over campus-based approaches. Students share experiences during their study of the theory of their profession, and can bring theory and practice together in ways that start to break down the unhelpful divide between the two.

Most students have to learn how to use communication software and in the case of the OU, FirstClass has been the software most often used, not least because of its ability to support such large-scale usage. We now have over 200,000 students annually logging onto our systems and using them for all forms of study and assessment. In order to pass their course, most students therefore develop their ICT skills. However, explicit teaching in how to use the Internet is a mandatory element in most degree programmes, and some courses have achieved great success in this area.

CONCLUSION

One of the themes of distance education journals in the last two decades has been the idea that campus-based and distance education provision was converging. ICT has been a driver for that debate. Where courses are delivered wholly online, new forms of interaction and collaboration are developing (Thorpe, 2002). One impact of the ease of communication enabled by e-mail and conferencing is that tutors and students are in more frequent contact and teaching is more continuous than in second generation distance teaching, with tutors logging on every few days, if not daily in some cases. They may indeed be more frequently in touch than are campus-based students with their tutor. What we are seeing in other words, is not the replication in a virtual context, of a model of campus-based teaching that dominated higher education for centuries, but the emergence of new forms, opening new opportunities. Although our focus here is on distance education and lifelong learning, these opportunities are there for campus-based higher education too.

It is always difficult to claim that practices are being revolutionised in education – how different does something have to be in order to count as a revolution? Without doubt though, we are seeing systematic evolutionary change in how we teach and learn, bringing positive advantages to distance education if we are willing to invest in the development and continual improvement of effective applications of ICT. Much hinges on that condition, as many who have been frustrated and disappointed by their experience of online learning will know. Technology offers us a great expansion in the possibilities for communication. It is up to us to turn those possibilities into reality, and in so doing, to create new opportunities for lifelong learners.

POLICY CONSIDERATIONS

This discussion of ICT usage for courses studied by adult learners, has touched on a number of policy issues. These are drawn together here and elaborated.

- ***The impact of ICT goes wider than just the structure and presentation of courses – teacher roles, course design, support systems and the curriculum require development as a result.***

The use of the Web for both delivery and communication with students is impacting on the roles and workload of both course teams and tutors. Courses are being produced more quickly, within a two-year period and under, but updating is required every year and academic input is spread more evenly across the course life. Course teams also use conferences to maintain regular contact with tutors, and can respond to their views of the course more readily. The boundary between course teaching and learner support is breaking down, and electronic communication is enabling new forms of online teaching to emerge (Thorpe, 2002). Introductory courses in ICT skills are being developed, and all degree programmes need to build in ICT skills to student learning outcomes.

- ***Institutions require a framework within which strategic decisions about use of ICT can be made: institutional strategies for learning and teaching are one way of achieving this.***

Use of new technologies has wide ranging impacts on institutions, and individual teachers are unlikely to be able to reap their benefits unless the institution as a whole invests in new infrastructure and develops staff, both technical and administrative. The Open University's strategy for learning and teaching has set

targets systematically for the use of ICT and this has ensured that all course teams have to address the issue and cannot simply leave it to more adventurous colleagues. Learner support has also been made available online as well as via the telephone, and there are now extensive resources provided for course choice, study skills, computer use and vocational guidance via the OU Web site (www.open.ac.uk/studenthome/experience/index.shtml).

- ***Staff using ICT need support to develop their skills on a continuing basis; access to information and staff development must be provided.***

Associate Lecturers, who tutor OU courses, have participated in regionally based training in using ICT, and have access to Tutorhome, a site providing extensive resources and guides for all aspects of their role. The Institute of Educational Technology has developed the Knowledge Network, which provides both access to research and evaluation carried out on all OU courses and teaching methods, and support for academic staff wanting to find colleagues with relevant expertise (www.kn.open.ac.uk/). Regular workshops create a social context for this sharing of good practice.

- ***Use of ICT for teaching must address issues of access to the technology constructively***

The UK is fortunate to be able to resource many public sites for access to the Internet and a personal computer, such as schools and libraries. Personal ownership is also high – among OU students in 2003 for all except language students, 90 per cent or over had access to a computer. However, of greater relevance now, is the need to match the kinds of usage of computers to the kinds of machine and personal skills possessed by students. Technology does also offer new possibilities for access to learning for those with special needs. Standards are now in place that software developers need to use so that their sites and resources are as accessible as possible (Cooper, 2003).

- ***Evaluation of students' response to use of electronic resources and computer mediated communication is essential, with continual updating and refinement built-in to the teaching process on a regular basis.***

Courses benefit from refinement once they are being studied and it is clear to see their strengths and weaknesses from the students' perspective. It is often the case, for example, that students take longer to complete activities and study tasks than expected, and such courses can be improved by cutting material and giving clearer advice about what and how to study. It is also particularly difficult to judge what the student experience is likely to be, where the skills and the equipment used by the student cover a wide range. There is an even stronger rationale, therefore, to evaluate the student experience and to plan for courses to evolve, with each presentation.

RELEVANT INTERNET SITES

For online learning accessibility:

IMS Guidelines for Developing Accessible Learning Applications
www.imsglobal.org/accessibility/accessiblevers/index.html

Web Accessibility Initiative's 'Web Content Accessibility Guidelines'
www.w3.org/TR/WAI-WEBCONTENT/

For information about usability and Web design generally:

www.useit.com/alertbox

For access to Web resources and contacts concerning research and development at the Open University:

<http://kn.open.ac.uk/public/>

For access to research publications about ICT in distance education, developed by NKI Distance Education:

www.nettskolen.com

For information about ICT in UK further and higher education from the Association for Learning Technologies site:

www.alt.ac.uk

REFERENCES

- Cooper, M. (2003). Communications and Information Technology for Disabled Students, in Powell, S. (ed) *Special Teaching in Higher Education – Successful Strategies for Access and Inclusion*. London, Kogan Page.
- Daniel, J.S. (1996). *Mega-universities and Knowledge Media: Technology Strategies for Higher Education*. London, Kogan Page.
- Dave, R.H. (ed.) (1976). *Foundations of Lifelong Education*. Hamburg: UNESCO Institute for Education and Oxford, Pergamon Press.
- Kukulska-Hulme, A. and Shield, L. (2004). The keys to usability in e-learning Web sites, www.shef.ac.uk/nlc2004/Proceedings/Individual_Papers/Kukulska_shield.htm accessed February 2005.
- Macdonald, J.; Twining, P. (2002). Assessing activity-based learning for a networked course. *British Journal of Educational Technology*, Vol. 33, No. 5, pp. 603-618.
- Mackintosh, W., Mason, R., Oblinger, D. (2005). Editorial: An ODL perspective on learning objects, *Open Learning*, Vol. 20, No. 1, pp. 5-13.
- Mason, R.; Kaye, A. (1989). *Mindweave: Communication, Computers and Distance Education*. Oxford, Pergamon Press.
- Preece, J. (2000). *Online Communities: Designing Usability, Supporting Sociability*. Chichester, Wiley.
- Rae, S. (2004). Comparison of helpfulness ratings of the various course components by Central Academic Units – Courses Survey 2003 data. <http://kn.open.ac.uk/document.cfm?docid=4491> accessed 19 February 2005.

- Rausch, A.S. (2003). A case study of lifelong learning in Japan: objectives, curriculum, accountability and visibility. *International Journal of Lifelong Education*, Vol. 22, No. 5, 518-532
- Thorpe, M. (1998). Assessment and “third generation” distance education. *Distance Education*, Vol. 19, No. 2.
- Thorpe, M. (2002). Rethinking Learner Support: the challenge of collaborative online learning. *Open learning*, Vol. 17, No. 2.
- Thorpe, M.; Kubiak, C.; Thorpe, K. (2003). Designing for reuse and versioning. In: Littlejohn, A. (ed.), *Reusing Online Resources: A Sustainable Approach to E-learning*. London, Kogan Page.

Notes

1. Streaming audio is audio and broadcast material that can be accessed by a Web browser or other appropriate software on a personal computer.
2. This course is the focus for a case study, undertaken by Mary Thorpe and Stephen Godwin, both of the Institute of Educational Technology, as part of research into interaction in computer-mediated teaching, funded by the Andrew Mellon Foundation, USA.

THE CONTRIBUTOR

Mary Thorpe

Professor of Educational Technology at the Institute of Educational Technology,
The Open University, UK.

E-mail: m.s.thorpe@open.ac.uk