

# The impact of technology on distance education

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## ABSTRACT

Over the years the method of “distance education” has evolved - from correspondence study through postal delivery to learning supported by information and communication technologies (ICT). This paper discusses changes induced in the distance and flexible educational organizations by the introduction of Information and communication Technologies. The paper seeks to determine what changes are being introduced by the technology and how organizations are responding.

## Key words

distance education, change management, ICT-driven education.

Distance Education, which was “once considered a special form of education using non-traditional delivery system is now becoming an important concept in mainstream education” (Mclsaac and Gunawardena 1996, 403). The use of information technology has not only given distance education recognition but has made it a dominant force in higher education. With its traditional root in the use of technology, the distance education has “provided a valuable test-bed for understanding the potential and limitation of wide range of technologies in education: (Bates, 1995, 22) Traditionally, distance education was a cater for the educational needs

of those who were unable to attend conventional classes but with the advancement in information technology anyone can be a distance learner (Imel 1998)

Let us analyse the work of a lecturer in a typical tertiary institute. We use a combination of texts, lectures, graphics and video to deliver instruction in the classroom. We supplement the instructional materials with human interaction in the form of discussion and establish a dialogue with our students. We give the students some homework and evaluate their performance using examination papers. All these activities can be replicated using the Internet’s various modes of communication, including the Web, e-mail, Internet chat (Dickinson, 1977).

To enhance our teaching, we can place our lecture on a Web home page; we can combine the text of the lecture with pictures, diagrams, audio and video clippings – thus creating a digital document. Using the client-server model of the Internet, we can place this information on a server; the student acquires the ability to access course material anywhere, any time through a client computer and this indeed is one of the strengths of the emerging communication mode, which does not require coincidence of presence. They can choose the time and place - when and where they are ready to learn. The good side of this way of delivering instruction is that changes in the instruction are not only easy, but take effect immediately. We can augment our instruction by creating branches to other pages on the Web, thus allowing students to explore the subject in a greater depth. At the Open Polytechnic of New

Zealand we are using a list server, E-mail, Inter chat and interactive Web pages to support our students. At the AUT (Auckland University of Technology New Zealand) the use of Lotus Notes is becoming an integral part of the instructional process for modules in the Bachelor of Business programme; the resulting collaborative environment is used mainly for communication and exchange of ideas but also as for creating knowledge artifacts such as references and short essays. Collaborative technologies help to overcome the one-sidedness of tools like e-mail and the educator can use them to provide feedback and motivate and support the process of transforming information into meaningful knowledge.

A Web page with forms is a basic assessment tool that could be created using a software package such as MS FrontPage 97. All we need in the background is the CGI (Computer Gateway Interface) protocol, which allows two-way communication on the Web. A wide range of commercial software for computer-based training is available.

Following is a description of some of the tools that we can now implement and experiment with in our efforts to enhance educational practices through the Internet and the World Wide Web.

One of the tools we are effectively using at the Open Polytechnic is a list server, which supports a bulletin board discussion. As we know an electronic mail address (e-mail address) is the equivalent of a postal mail address: a mailing list server is in fact a distribution point E-mail address that can forward mail to many different e-mail addresses. To be a bit more precise, an automated process accepts mail sent to the list server's address, processes it and resends it to a set list of addressees. The lecturer is the owner of the mailing list and he is responsible for maintaining the list server (what this basically involves is keeping current the list itself). Other responsibilities of the lecturer depend on the type of list server. They can include dealing with bounced messages, approving messages sent to the distribution address before they are resent, writing a short description of the list, and guiding the tone or the direction of the discussion which is taking place through the exchange.

We are using majordomo as a mailing list management program (developed by the Academic Computing Services of the University of Chicago). As a tool designed to help list owners to manage their mailing lists, the program handles routine administration tasks automatically and reduces the personal workload of the lecturer (list owner). Typically, students and lecturers ask a question or make a remark by posting an e-mail message to the bulletin board - just like we would pin a note on a bulletin

board. Every one in the class sees the message and responds or comments - if they feel the need to respond.

While bulletin boards and e-mail are mostly used for asynchronous communication, online discussions can be conducted through exploring relevant Internet technology for synchronous dialogue between a lecturer and a class of students. A live conference room or a chat room can be set up for all students in a class to log into at the same time. Whatever a student types on his workstation is displayed along with his name and is broadcast to all participants of the conference. Protocols must be established to facilitate the orderly flow of discussion. The discussion text can also be stored so that both participants and other parties can later review it. This technology involves high levels of cooperation and needs careful management; motivation of teachers and students is one of the critical success factors, as pointed out in the paper prepared by John Mitchel & Associates (1997). The learning environment is active and student-centered; it provides work spaces for students to build their own bases of knowledge and understanding. While teachers can use the conference as an environment for collaborative learning, students still "own" the information base created through their collective effort feel empowered to contribute and "be listened to".

*Online Course and Reference Materials:* In this mode, the lecturer posts documents such as course texts, practical exercises, case studies and other reference materials to a course Web page where the students can access them via a Web browser. There are obvious advantages to this method over traditional paper-based resources; more specifically the instructor is able to make resources available through hyperlinks or even direct citation, rather than recommending materials, which may be difficult to find - particularly where extramural students do not have access to libraries. Furthermore, many students, in contrast to printed resources, of which an institution will only have a few copies, can access online resources simultaneously.

Currently however the Internet offers lower-quality (almost free) material than traditional "paid" reference sources such as books and journals. The obstacle to providing quality online reference sources lies in the lack of an established electronic payment infrastructure, which would make it worthwhile for authors and publishers to make their works available digitally. A recent development in e-commerce, micro transactions, is suited to make this possible through the automatic payment of small amounts of money occurring each time a resource, or part of a resource,

is accessed. We also anticipate that whole new industry to emerge – the online equivalent of today's libraries, unrestricted by geographic or social boundaries (Kalakota, 1997).

*Direct E-mail Communication:* This is the most common mode of electronic communication we use; students send e-mail messages to us directly to seek individual assistance or to comment on some aspect of their learning. E-mail exchange has proven to be one of the dominant uses of the Internet both in academic and business circles. Its advantages are by no means restricted to a learning environment, and include faster, more responsive communication which (unlike voice communication, for example) can be easily archived, and does not require the communicating parties to be all present at the same place or time. E-mail has also been shown to have an impact on hierarchical structures, and has great potential to make the instructor-student relationship more collaborative and less authoritative. Finally, e-mail encourages peer-to-peer communication by breaking down interpersonal barriers amongst students. This allows a learning culture to form within a class, independent of geographic and social factors, at the same time entailing inevitable extension of working time an intensification of work for teaching staff (Noble, 1998).

*Workgroup Computing:* Workgroup computing is a computing paradigm to enable groups of people to work together, for instance to create publications, reports, or databases. A case in point might be a market survey report to management as a basis for deciding whether the company should venture into a new market. Students simulating a company environment can do this. There are some entirely new advantages to be gained by "sharing" data for a particular assignment among a number of applications - and by enabling a number of people to work on the same document at the same time. One student may be responsible for gathering information about the market. Another may be responsible for compiling a comparative dataset - perhaps using data from the company's own internal accounting - and a third student may be assigned the task of covering the data into presentation graphics for inclusion in the final report by a fourth student. Workgroup systems are designed to facilitate such an interactive exchange of information. Furthermore, in addition to these more advanced options, most workgroup systems contain a wide range of standard functions such as electronic mail (including images, fax messages, or even entire databases), as well as calendar systems that facilitate the planning of meetings and other staff activities.

MS Outlook, used in conjunction with MS Exchange and Lotus notes are example of a workgroup system implemented in corporate environments today, and could be a good candidate for an academic collaborative tool.

*Multimedia and Education:* Multimedia provides a fast, reliable and easy-to-use computer interface and presents information in a way that holds a student's attention. It is always fresh, clear and comprehensive. It allows the tutor to control the processing of information and presentation and to tailor the computer's ability to question, analyze, and respond – thus guiding the student along a path that best meets the learner's needs.

Multimedia technologies found their first significant application in computer-based training (CBT). Learning to assemble a machine or to understand a complex procedure requires visual realism, which CBT achieves by delivering controlled video segments from a videodisk. Students navigate the information at their own pace, while the system maintains a progress record. CBT courseware from CBT Systems is currently available on the Auckland University of Technology Intranet.

The future holds even more exhilarating prospects: animated visualizations and teleconferencing, even a new form of electronic publishing in which collaboratively created works through groupware products like Lotus Notes can fuse text, art, animation, video and audio in a compound document accessible over the Web. This paper has touched just the tip of iceberg. Momentous changes wait the future generation. The ability of educational institutions to grasp and incorporate the innovative changes ahead will spell the difference between being mediocre or excellent. Internet combined with multimedia tools can bring about exchanges and spread of ideas in a global environment at an accelerated pace. We have before us a sea of change awaiting us to master it and use it in a responsible manner. An understanding of potential that awaits us will change forever the way education and knowledge is presented, taught and delivered.

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