

Applications of Computer Technology in Distance Education: The Case of the Open Learning Institute

by Ian Mugridge

The Open Learning Institute of British Columbia (OLI) is a publicly funded, distance education institution, delivering programmes and courses throughout the province. It was set up by order-in-council of the provincial government in June, 1978 and given a mandate to deliver 'by distance means' programmes in the three areas of adult basic education, career-technical-vocational education and undergraduate degrees in arts and science. From this broad yet specific mandate, the institute has developed to the point where, beginning with seven courses and 750 students in its first, pilot semester in September, 1979, it now offers over a hundred and fifty courses in its three programmes and will have just over 16,000 course enrollments during the 1984-85 fiscal year. The number of courses continues to increase rapidly as new programmes, particularly in the career-technical-vocational area (CTV), are brought into being; and the enrollments are also increasing, though at a somewhat slower rate than in the past. (For an account of the early years of OLI see Ellis & Mugridge, 1983).

The application of various kinds of technology to distance education is a much discussed problem, made more complex by the fact that distance education is itself a new technology, a new method for developing courseware and delivering it to students who are "at a distance", however that distance is defined (See Bates, 1984). It involves the use of a variety of media—print, audio tapes and radio, video tapes and television, teleconferencing and a number of computer applications—as well as more conventional forms of learning such as personal interaction between teacher and learner and written commentary on written assignments. The mix of such ingredients varies from course to

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course and even from unit to unit within courses, depending on the nature of the material, the objectives of the course or unit, the type of learner or learning involved and so on. It follows then, that there is no single prescription for using any particular medium of instruction, no single way of putting a variety of media together to assist effective learning.

This consideration applies particularly to OLI, which is a unique educational institution in that it is the only distance education operation which combines within a single organization all levels of pre- and post-secondary education. Within the three programmes mentioned earlier, courses have been or are being developed in areas as diverse as English as a second language and Shakespeare, introductory computing and advanced mathematics and in subjects like history, economics and chemistry and practical courses in nursing, electronics and travel counselling. Clearly, teaching and learning methods, learners' objectives and expectations in such a wide variety of subjects and levels must be expected to cover a very wide spectrum; and the courseware developed to meet these needs must reflect this fact. Course development at OLI has always been based on this assumption.

It has to be admitted that the consideration given to the use of a variety of media and to varying the mix of these media has not always been as extensive as it might have been. The national tendency to stay with familiar techniques of demonstrated effectiveness is present in all educational institutions, even in new ones working in new ways. The more practical consideration of cost also restricts, particularly in a period of uncommon restraint, the use of some of the more elaborate and expensive media.

Nevertheless, the institute has made and will increasingly make contributions to the use of a variety of media. Experiments are being conducted with the use of live interactive television though this is still being undertaken on a very limited basis. (In this area, major attention should be given to the psychology courses offered in this mode by

North Island College in B.C., courses which probably equal or excel any use of live interactive television to this point in Canada.) Audio tapes are being used increasingly and with growing effectiveness in areas as diverse as language teaching (including the teaching of English as a second language) and a senior university level Shakespeare course where audio tapes are being used to demonstrate the effectiveness of a number of interpretations of the same passage. Television is being used to demonstrate activities as various as experiments in high school biology and methods of repairing automobiles in an automotive mechanics course. Such experiments are being combined with continued use of print materials which still form the basis for most instruction at OLI. It is anticipated, however, that developments in the next few years will affect this balance in major ways. Nowhere is this potential greater than in areas where computers can be used as an aid to instruction.

Before turning to this matter, I will deal with computer applications in the management of distance education and in the development of distance education materials. Both of these are areas of great importance and ones in which considerable advances have been made in recent years. There is no sign that the speed and magnitude of such advances will diminish in the foreseeable future.

In the area of management of distance education, OLI has developed a unique package known as the Distance Education and Training Resource Management System (DETREMS) which manages all aspects of student admission and records, tutor payroll, assignment grading and exam scheduling, transcript preparation and formal communications to students, student accounting and management data requirements. An enhancement to this system which is almost complete is the Course Management Inventory System (CMI) which will be fully integrated with DETREMS and will thus automatically instruct the warehouse to ship course materials to students registering, adjust inventory figures and flag courses in which stock is

low. This system, which runs at OLI on a VAX 11/750 has attracted a great deal of interest not only in Canada but also in other parts of the world (See Pates, 1984); and it has the potential for significant further advances, for plans are already being made to upgrade and increase the flexibility of the existing system by adding a student evaluation and management system, to build links to an integrated courseware authoring, production and distribution system and to a courseware development management system.

The second area in which significant advances have recently been made is that of the design and development of course materials. At the conference of the International Council on Distance Education in 1982, one of the papers spoke eloquently of the power of text processing as a tool for authors and editors (Cooper & Thompson, 1982). Such systems have been in use at OLI for some time; but an even more important development occurred in 1983 and 1984 with the development of the institute's first two university-level chemistry courses. In this case, the course writer, course consultant and course designers were provided, in their separate work places, with microcomputers, communications software and telephone modems. The use of these systems and links significantly enhanced the development process in terms of effectiveness, efficiency and time involved (Timmers, 1983).

Another development which was, in part, an offshoot of this process has been the construction of a computerized course formatting system. This was initially subjected to the criticism that such a method would impose unacceptable restrictions on course writers and designers, obliging them to design their material according to the requirements of the format rather than the other way around as should be the case. This has, however, not been the case; and the use of the format has provided instead a great degree of freedom as well as the ability to develop courses which are readily transferable from one institution to another. Evidence has been supplied by the use of the system in a training scheme for faculty members in chemistry and biology from the Universiti Sains Malaysia (USM) in Penang. This project, which is being funded by the Canadian International Development Agency and has just completed its second phase, involves four faculty members a year spending two months at OLI working on courses to be used at USM. The use of a common course format ensures the ability for both institutions readily to use each other's material (Timmers,

1984).

These developments have added significantly to the institute's effectiveness and efficiency in the areas where they operate. As the new systems are being tested and implemented, as their use becomes more effective, plans are also being made for modifications and additions. It is hoped that, within the next three years, a system will emerge to link the existing DETREMS and course development systems with new systems in such a way that OLI will develop an integrated system which will combine the development, production and distribution systems as well as those for student services and support and for management of all these activities. Given appropriate support, this ambitious goal will become a very practical possibility. In addition to this extensive work in the use of computers to manage distance education, OLI has also undertaken a good deal of work in the direct instructional uses of computers and computer-related techniques. The videotex system known as TELIDON, which will, if widely used, make banks of information available to students through home television, has been evaluated and experiments begun with its use in a computer-aided learning mode (Love, 1982). The results of such experiments are being added to the data supplied to those being carried on at other institutions and will influence the direction of future work in this area (For a discussion and summary of such work see Kaufman, 1984).

It remains to outline briefly the activities which are being undertaken in direct instructional areas. Little instruction in computing has been offered so far. OLI's first experiment in this area was the development of a basic computing course using TRS 80's which were delivered to students' homes. This non-credit course was extremely successful and was discontinued only when the equipment and material became obsolete (Kaufman & Meakin, 1982). Apart from this, however, the institute has not solved the problem of delivering practical computing instruction at a distance to those students who require more advanced applications. It is likely that widespread implementation of hands-on computing instruction will have to await the greater availability of microcomputers and other conditions necessary for distant students to enter this area in large numbers.

In the area of computer-aided learning, work is in progress on two major projects which will demonstrate the potential of CAL for distant learners. The first of these is a package for instruction at the second-

dary school level on food and nutrition. The second is a project being undertaken in conjunction with the Certified General Accountants of Canada and McGraw-Hill Ryerson of Toronto to develop a CAL package in introductory accounting. This will be available in the summer of 1985 and will considerably extend the use of CAL in this type of instruction. Both of these projects should provide extensive data on which to build future work in this area. With these developments and with the addition of instruction in management information systems and other computer-related areas to existing degree programmes, there is little doubt that the institute's involvement in expanding the use of computers in all aspects of distance education will continue and grow.

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