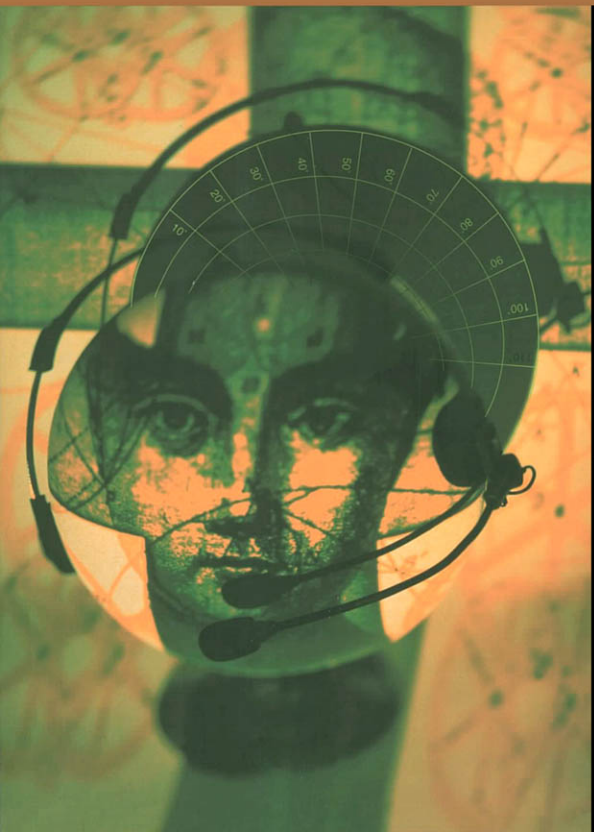
A NEW WORLD of KNOWLEDGE

Canadian Universities and Globalization



Edited by Sheryl L. Bond and Jean-Pierre Lemasson

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Chapter 8

The Impact of Information Technology on National and Transnational Education

Jon Baggaley

With the emergence of each major communication technology, Canada has played a prominent role in its development. The nation's geographical vastness has caused it to attach particular importance to the educational development of its communities, and, unlike other countries of a comparable size, Canada has been blessed with the funds to explore the uses of information technology for this purpose. In the late 1990s, however, Canada's advantages are no longer as distinctive in this respect as they once were. Educational organizations in the developing world are rapidly becoming as well endowed with technology as Canada and are looking with cautious optimism on the educational opportunities of the Internet and multimedia. They are also looking to Canadians to share the benefits of their experience to help them to harness the new media effectively. This chapter will consider the ways Canada can work profitably with international partners to realize educational technology's potential. It will examine the problems of maintaining the techniques and skills demanded by the educational media and the disappointments with which the history of educational technology is littered. It is hoped

that by the time the chapter is read, the Internet and other computer-based multimedia will not have gone the way of the dodo as so many other educational technologies have done — wasted through unimaginative use and squandered through mismanagement.

Teaching the global village

One of Canada's first advantages in the modern age of information technology was its good fortune to have as favourite sons two of the most notable communications theorists of this century: Harold Innis and Marshall McLuhan. Both thinkers drew attention to, inter alia, the global importance of media in communications. From the 1920s to the 1950s, Innis placed an interesting emphasis on the powers of transportation media to unite and transform culture (Innis 1950), and, in the 1960s, McLuhan led the world to think about the impact of the print and electronic media as no other contemporary thinker had done previously (McLuhan 1962, 1964; McLuhan et al. 1967). He suggested that the media would put an effective girdle around the globe, transforming it into a "global village," and he identified the contribution of the media themselves to the messages they convey. In fact, Innis had been even more specific on this question than McLuhan, in stressing that the impact of a technology arises from the techniques associated with it. Both of these influential Canadians made it self-evidently clear that media techniques would, if misused, fail as often as they succeed in delivering their intended messages.

If there is one type of technologist who should be particularly aware of the possibility of messages being misunderstood, it is the one who applies media in education. To the detriment of many educational technologists, however, they have failed to take the teachings of McLuhan and Innis to heart, blinkered as they tend to be by the exciting, even if unproven, possibilities of each new medium. They may actually have been encouraged in this optimistic attitude by McLuhan's prophesy of the global village. However, as any other son of a small-town Alberta community, McLuhan surely must have realized that this village would not be all harmony and caring; indeed, the global community soon discovered that the culture created by the broadcast media was as much one of warfare and pain as of enlightenment.

Thirty years later, despite McLuhan's prediction, the media have proven no more successful in creating a dominant educational perspective for the globe than they have been in creating any other form

of universal enlightenment. But in the 1990s, this may be changing. A new medium has emerged with such cost-effectiveness and universality that it promises a greater level of international understanding than any previous medium. The Internet has taken over from television as the most powerful information technology.

One of McLuhan's observations about television indirectly explains the Internet's current potential. McLuhan observed that television was, at that time, the one medium powerful enough to carry all the others. Broadcast television, McLuhan pointed out, is capable of carrying all types of aural and visual information. It conveys sound, colour, light, shade, movement, the human voice, and the images of all other media. When McLuhan noted this, no other medium could claim the same ability. In the mid-1990s, however, the Internet began to assert itself as a new medium capable of carrying all the others, television included. In the next 10 years, television and the Internet will doubtless merge into one, and the hybrid will be a new supermedium for the next generation. The debates about its appropriate use, however, will be the same as those that people have waged regarding the use of any communication medium for centuries.

Before television was the printing press, a source of controversial material from its inception. Before that, the "word" was carried by traveling actors and minstrels, whose messages were considered every bit as pernicious as any TV program or pop song today. In the 1890s, cigarette-card collecting was held to be a similar danger to society, filling the minds of its male youth with no good thoughts for hours on end. Interest in every medium and pastime yet invented — snooker, pool, television, video games, and now the Internet — has been regarded as a sign of a misspent youth at one time or another. Yet, no medium is better or worse than the content it conveys and the uses to which it is put. To those who happily watched TV wrestling or sorted cigarette cards with their fathers on a weekend afternoon, the gratifications yielded by these media were unbeatable.

In the 1970s, the "uses and gratifications" of media became a major criterion in the scholarly assessment of their social value (Blumler and Katz 1974). At the same time, in the educational corner of media communications, evidence was amassed about the subtle impact of various media production techniques. Canada took an international lead in the design of effective techniques and processes for television's use, not merely at the broadcast level, but also in the service of Canada's many isolated communities. Canadian film and video specialists took their cameras to record material in remote communities across the country, north and south, for use in educational

and social programs. Two of the most influential of these early programs were the "Challenge for Change" program, created by the National Film Board of Canada, and the "Fogo Process" of Memorial University in Newfoundland (Gwyn 1972). The techniques they developed generated a new international awareness of the potential of media in community development. Canada's example in this respect has since been followed on every continent and has demonstrated that the techniques of the traveling player–educator are as effective in the late 20th century as they were in medieval days and as powerful when assisted by a video camera as when accompanied by a strummed lute.

Numerous pioneering Canadian technologies have assisted in this process. In the 1980s and 1990s, for example, the Teledon and Alex systems both promised to bring useful audiovisual information, on demand, into homes and workplaces across the land. Unfortunately, each of these systems failed in the marketplace for want of adequate updated content. Other Canadian innovations, including some of the early pay-TV enterprises of the 1980s, failed because they were either too expensive or too esoteric, or not esoteric enough. In short, Canada has had no shortage of innovative flair in the media and communications field and plenty of disappointments, and it has demonstrated a distinctive theoretical and practical expertise in the use of every information technology yet devised.

The collective wisdom about the reasons for Canada's adventurous spirit in the communications industry points to the following factors:

- The nation's vast political landmass, second largest in the world;
- The absolute need to surmount the communications and cultural problems that the vast landmass has created; and
- The pioneering flair that brought many nations together as Canadians.

The unusual range of the nation's educational-media experience, from urban to rural, has taught that effective education is as much a matter of communication process as of product, which is an understanding more commonly found in nations that cannot afford teaching tools as expensive as television or the computer but have become ingenious in using far simpler devices. In more affluent nations, teachers are apt to move on from one promising medium to

the next, after their first failures to use it properly, a tendency that leads them to overlook the possible reasons for

- Their own failure to adopt the appropriate applications;
- Their own failure to create adequate resources to supply the medium with effective content; and
- Their own failure to account for the classroom processes needed to enable students to efficiently interpret this content.

For example, at a recent media conference (held, incidentally, on the Internet), some Americans and Canadians decided that educational television is a medium *manqué* and that the tool of choice is now the Internet (World Bank 1996). But if educators have failed to make efficient use of the rich television medium over the years, can they have any greater hopes of harnessing the Internet? If they heed the lessons of their previous successes and failures, they may succeed, however, as even a cynic would have to admit that the Internet has some new advantages.

The Internet as a supermedium

The Internet is the first medium to allow unimpeded, interactive access to information from anywhere in the world that has a supply of electricity. A computer with Internet software can be run from the cigarette-lighter socket of a jeep in the fields of Africa as easily as on the streets of New York (Baggaley 1997). It can communicate by increasingly inexpensive satellite means from either of these locales to the other. The Internet can bring live music and comment from the radio stations of the world to one's desktop; with a little extra effort, it can carry the images of television and can be carried on it. It allows the world's students and teachers to share information previously inaccessible to them; and distance-education programs and institutions are developing around this concept on every continent. On this basis, the "developed" and "developing" worlds are drawing nearer to one another with remarkable speed, and Canadian scholars who take sabbatical leave in parts of the developing world are shocked to find that the facilities there are often superior to those of their own universities back home. This lament is heard increasingly as Canada's educational institutions continue to suffer through their 1990s' era of relative economic hardship. They hope to emerge from

this low point with new structures and priorities in place and new methods to attract a wider student revenue base.

For this purpose, Canadian educational institutions are extolling, almost in unison, the benefits of online and distance-based course delivery and the Internet's unique ability to carry it. However, even the largest of universities do not possess the ability to implement an online strategy overnight. The pedagogical approaches of traditional institutions do not readily lend themselves to media delivery, and the institutions themselves often lack a cohesive view of the steps they need to take in developing or converting their courses for this purpose. For example, one Canadian university recently stated that it needed to increase student numbers to augment revenues and fulfill its obligation to offer degree certifications to students in remote parts of the province. To achieve this, faculty members throughout the university recognized the importance of developing distance-education courses for delivery by television and the Internet. A need for university cuts, however, led simultaneously to the closure or restructuring of programs throughout the university, including the one department with the human resources needed to create the required mass of distance-based course materials. The lack of shared institutional perspective among the university's administration and faculty led to the abandonment of its distance-education plan, although it was identical to schemes bringing new revenues into universities and colleges across the continent.

If the educational institutions succeed in creating a technological infrastructure for their course delivery, they still face the hurdle of generating a continuous supply of effective teaching materials. The current demise of educational television as a popular institutional medium is largely due to the unforeseen complexity of its production process and the inordinate amounts of time and resources needed to produce an adequate supply of programing. The challenge of placing educational programs on the Internet will be no less taxing. A teacher who has been accustomed to entering a classroom and lecturing extempore can be shocked to find that delivery at a distance requires all course materials to be prepared in advance, not just the classroom handouts, but also a text containing the spoken words and illustrations, for each lecture. If the only adequate medium for teaching a particular topic is television, the teacher may also be challenged to produce a fully featured videotape for every class; and even with the assistance of an expert institutional media service, producing this can tax the time and patience of the greatest media enthusiast.

In addition, the materials have to be kept up to date, and copyright clearance needs to be secured for the use of every passage, picture, or diagram created by other authors. At present, copyright clearance of course materials for electronic delivery is by no means automatic (see the next section), and teachers may be unable to use many of their favourite slides and quotations when they move their materials online. In general, effective distance education involves far more work for the teachers than might be expected. Even institutions with a specific distance-education mandate are feeling the pressures that online delivery creates. For example, a 1998 survey at Florida Gulf Coast University revealed that a majority of faculty are distinctly opposed to its use in their teaching. "The problem," the faculty members said, "is that teaching via the Internet — using e-mail, chat rooms and other electronic means — is a demanding proposition for professors ... because of the large majority of student–teacher contacts" (McKinnon 1998, p. F1). Indeed, the addition of technological bases for teaching seems to have given rise to an assumption that teachers can now return to the time-honoured one-on-one model. However, to the teachers of Florida State and elsewhere, this is clearly no less time consuming and unrealistic via distance media than via conventional means.

Ironically, teachers who have not experienced the logistic burden that educational automation involves are apt to voice the opposite fear, that information technologies will make them redundant. Robertson stated that by 2000, students would be learning with the help of "virtual communities," smart agents, and mentor networks and that without schools to staff, teachers would no longer be necessary (Robertson 1998). The vocal opposition that this prospect is likely to generate will be sufficient to sink many distance-education efforts, whatever the merits of the opposing arguments.

It is to be hoped that moderation will prevail and that solid evaluation studies will lead to a sensible harnessing of the new media. By 2000, Internet technology will be capable of providing untold new advantages: transmitting, for example, a high-quality, live audiovisual image of the teachers themselves, thereby allowing them to combine personal and impersonal forms of distance-based teaching as appropriate. At this point, the wheel of invention will have come full circle, and if we are not careful, the new media will be used as unimaginatively as educational television was used in the 1970s. The 1990s' conception of the Internet will be discarded, as was an earlier conception of television, as being too full of poor programing and advertising to be educationally respectable. Last-ditch attempts will be

made to share Internet programing among higher education institutions, but this move will be resisted as faculty members point out that other institutions' materials are inappropriate for their students. The main users of the Internet for information delivery will be the corporate sector, which will continue to develop extremely efficient training materials distributed via CD-ROM and other multimedia delivered on the Internet and the World Wide Web.

It is in the commercial sector where the Internet's most prized ability will be maximized: its ability to enable all sides of a communication link to interact. The lack of effective interactivity was television's major limitation. Phone-in programs and talk-shows were the best it could achieve by way of audience participation, however much its producers and presenters longed for it. The Internet, however, will make each medium it carries fully interactive. Managers on the road and in the air will videoconference with hundreds of staff members at their desks; families and friends will unite around the world for fireside chats on each others' television sets; and teachers will begin to use educational technologies in a new way, not as a means to produce old-style productions, but as a forum for interactive communication. If the function of media is seen as being to generate communication processes, rather than products, the Internet may become a completely cost-effective, interactive medium, capable of linking teachers and students as effectively at a distance as in the classroom. Otherwise, the old mistakes will be repeated, and the virtues of the Internet will be forgotten in the excitement of a new wave of information media. If the history of educational technology holds true, the Internet will be far from the supermedium it promises to be.

The international move to distance education

However, Canada can play a major role in anticipating the pitfalls of media-based education and helping to optimize its international benefits. Canadians can advise on the use of new media, such as the Internet, just as they did previously in identifying techniques for the use of video and film in remote communities of Newfoundland, Saskatchewan, and the Canadian north. Knight (1995) indicated that Canadian universities are increasingly aware of, and interested in, opportunities for international collaboration, and they rate international development projects highly (fifth out of 18) among their priorities for international collaboration. As other nations establish the technological infrastructures for development projects, Canada

can help to make them work and, in the process, learn about the innovative educational applications of low-technology media developed by less affluent nations before acquiring the means for high-technology education. In educational collaborations involving the Internet — which all nations are discovering more or less simultaneously — the gap between "developed" and "developing" will speedily close, and the international benefits will be reciprocal.

Of particular value in this respect is the fact that Canada is home to world-leading institutions that have delivered their courses by communications technologies since the early 1970s. Quebec's Télé-Université and the Athabasca University of Alberta are small organizations by comparison with the "mega" distance-education universities of other countries (Daniel 1997), but they have been in operation for longer than most of their larger cousins and are no less adept at survival. They can each give ample advice on how they designed and sustain their infrastructures for producing high-quality teaching materials, and they can also apply their experience of bringing effective media education to remote and underprivileged communities as they show newer institutions how to avoid the cardinal sin of educational technology: its tendency to polarize society into "haves" and "have-nots." This particular danger of technology-based education is well recognized by educators at distance-education institutions, especially those with an open-learning mandate.

Box 1
Athabasca University

Canada's oldest distance-education university — Athabasca University in Alberta — has followed the model of the "virtual university," operating without the bricks and mortar of traditional campus-based universities since its inception in 1970. It is also an open university, committed to providing lifelong learning through open access to high-quality university-level programs, regardless of the barriers of time, space, educational experience, and, to a great degree, level of income. From the outset, Athabasca University has taught 100% of its courses by broadcast and other media, including print, telephone, radio, television, and teleconferencing. Its student enrollment is drawn from all parts of the world and usually numbers in the range of 11 000–14 000. During the 1980s, computer-based materials were added to its suite of delivery media, and in the mid-1990s, it began adapting and producing course materials for distribution over the World Wide Web and on CD-ROM. In 1999, Athabasca University has more than 350 undergraduate and graduate courses on its books. By 2000, it hopes to be in a position to present the courses in its disciplines via traditional educational media or the Internet, or both, depending on the advantages of each. New course-development and course-sharing agreements — notably, those with the Télé-Université in Quebec — are broadening both institutions' international clientele and generally strengthening Canada's own role in the global distance-education field.

This is because, with the widespread use of computer-based media, distance education and open learning are coming into conflict. To be totally true to both concepts, an open university has to maintain the best distance-education approaches possible for the students with access to a state-of-the-art Internet-capable computer as well as students who can afford no computer at all. The earlier media of television, radio, telephone, and postal service were by and large accessible to all Canadians, and a distance-education university could safely expect its students to attend its courses via these media without undue hardship. The Internet, however, requires students with access to a well-stocked computer, a condition that a truly open university cannot in all conscience dictate. For this reason, every course that is either developed, converted, or revised for online Internet delivery must also be prepared for delivery at a comparable high level of quality on the more accessible, traditional media. As the design and attributes of all media are different, parallel sets of materials have to be developed for each course, and the logistics of maintaining this vast collection presents no small challenge.

It is of course tempting for those teachers convinced of the benefits of online education to concentrate on developing courseware for this student majority to the exclusion of the dwindling lower tech minority. The reverse temptation can also occur. A teacher whose discipline has been well served by more traditional media can disregard new opportunities to embrace new, potentially more powerful media. If their media selections are justified by ongoing evaluation studies, each of these attitudes may prove to be correct. However, no distance educator can afford to overlook the fact that the proportion of distance-education students with access to a computer is typically far higher (three times so in the case of Athabasca University students) than that in the student population at large. Either the students in distance-education institutions are being drawn predominantly from computer-owning sectors of society or they are being subtly encouraged to purchase computers after enrolling in their courses, and neither of these possibilities is compatible with the goals of open learning.

There is a current unfortunate trend in the philosophy of open learning to think of it as only an ideal, a goal for distance educators to aspire to. Regardless of whether this mind-set is justified, it appears that the growing use of computer-based media such as the Internet is already polarizing society into those who can and those who cannot afford distance education. To reconcile the increasing reliance on high technologies with the requirements of the open-learning mandate, distance educators are placing an increasing emphasis on

community-outreach services and parallel uses of computer-based and traditional methods. For this reason, the Indira Ghandi National Open University in Delhi and the Bangladesh Open University in Dhaka are placing a high priority on the use of older technologies (radio and video, for example) in rural outreach. Canada can use its process-based traditions for media education to assist such efforts while encouraging the evolution of the new multimedia as effective transnational tools, capable of continually adjusting their educational messages to the students' varying needs.

For instance, the International Development Research Centre (IDRC), based in Ottawa, is responsible for a major drive to establish communications infrastructures and practices throughout the world. Its Pan-Asia Networking Program provides a model for similar initiatives in Africa and Latin America. Through its Acacia Program, IDRC is training African technologists and educators to use their new networks to alleviate environmental and community-development problems and create electronic networks to share their experiences. IDRC, together with other international agencies, also hosts Bellanet, a secretariat dedicated to coordinating development strategies among information technology specialists. Another Ottawa-based agency,

Box 2
Commonwealth of Learning

Founded in 1987, the Commonwealth of Learning (COL) was the first intergovernmental organization with the mandate to encourage development of distance education and the sharing of open-learning–distance-education materials, expertise, technologies, and other resources for students throughout the Commonwealth and other countries. Its 54 member countries are from all continents and oceanic regions, North and South. More than 40 of these countries are active users of COL resources, which address all the needs of the education, information, and training sector, not exclusively those of higher education. COL's main activities are directed to the following objectives:

- To promote the use of communication and information technologies for distance learning;
- To facilitate access to affordable, high-quality learning materials and resources in support of formal and informal education;
- To provide access to training in the adoption and use of distance-learning technologies and techniques; and
- To provide information and advice about distance-learning systems, programs, and technologies to practitioners and developers.

COL's current initiatives include the integration of a series of national learning grids in Australia, Canada, India, South Africa, and the United Kingdom, with particular emphasis on school education.

Global Access Television (WETV), is the coordinating centre for a major initiative in the satellite delivery of television for international development. With affiliates in 30 countries, the WETV consortium provides clear evidence that television has not yielded to the Internet as the medium of choice in all parts of the world.

At St Francis Xavier University in Antigonish, Nova Scotia, the Coady International Institute continues to spread the international benefits of its 40-year experience with participatory (people-based) development techniques. Simultaneously, the Vancouver-based Commonwealth of Learning (COL), one of the largest distance-education secretariats in the world, is providing information technology services to the peoples of the Commonwealth, a notional one-third of humanity. Since 1997 the distance-education needs of the global francophone community have also been catered to by the Université virtuelle francophone, an intergovernmental agency based in Canada.

Other forms of collaboration in distance education involving Canada and international partners include initiatives to develop the following:

- An infrastructure for the implementation of educational technologies, involving Canada's Open Learning Agency and the Telesecundaria in Mexico;

Box 3
Université virtuelle francophone

The Université virtuelle francophone (UVF, virtual francophone university) is based in Montréal and represents 320 universities and governmental bodies in 52 nations (African, European, and Arab countries and those in the Indian Ocean region). The organization has the following objectives:

- To unite international francophone expertise in distance education;
- To build partnerships of excellence between North and South; and
- To increase the dissemination of knowledge throughout all regions of the world.

UVF's activities are based on a competitive model that aims to stimulate the best of distance-education methodologies and encourage their constant improvement. In developing its collaborative training activities, the organization's initiatives seek to make balanced use of the new technologies to ensure cost-effectiveness, pedagogical development, and the adoption of a participatory process that is satisfactorily respectful of diverse identities and cultures. UVF's emphasis is on establishing multilateral research and teaching teams to reinforce links between research, training, and community service. The organization is also stressing the need to define international equivalence for educational programs and courses and to promote opportunities for students to "cograduate" from more than one international institution.

- A joint curriculum for technology-based learning, involving the University of British Columbia and the Monterrey Institute of Technology in Mexico;
- A distance-education training program, involving Laurentian University and the South-West Institute of Technology in China; and
- Provision of accountancy courses by Athabasca University for students of the Tokyo Accounting Center seeking North American accreditation (Baggaley et al. 1998).

The list of Canadian information technology initiatives goes on, many of them drawing support from the extensive aid resource provided by the Canadian International Development Agency. This extraordinary proliferation of Canadian support for information technology projects suggests that knowledge and the sharing of knowledge are becoming effectively border free. However, one must remain cautious about the long-term international prospects for these multimedia initiatives. Despite their vast potential, the development of a totally international, "virtual" educational system is likely to face at least as much opposition at the international level as at the local one. The more the "have" nations offer their distance-education resources for others' use, the more the recipients are apt to fear an imperialist motive. The emergence of national distance-education institutions, formed specifically to resist external influences in their area, is already occurring, and a recent international forum held in Japan concluded that the most practical approach to forming international educational networks may indeed be to "think global, but act local" (Latchem 1998).

Following a review of current moves to form global, virtual universities, Cunningham et al. (1997, p. 180) concluded that "despite the activity in this area already, there is no guarantee that totally off-campus delivery will succeed," and they went on to remark that

> Questions of accreditation, articulation, language, accessibility, ownership, intellectual property, and copyright would have to be dealt with .... Economic and teaching/learning models would have to be developed, implemented and supported — and then these would need to prove to be efficient, effective and sustainable. Reliable and robust communication and technology infrastructures would need to be established. The requirements and expectations of a target student cohort would need to be identified and then fulfilled.
>
> Cunningham et al. 1997 (pp. 189–190)

Intellectual property and copyright issues have been hotly debated in academia since the time when early use was made of educational film and television in the 1960s, and these issues remain moot today. The development of distance-education courses raises particularly awkward questions about the rights of those who design and teach them. It is well established in the majority of Canadian universities that faculty members are the rightful owners of their academic materials, discoveries, and innovations, even in the face of institutional pressures to the contrary. Thus, the teacher can expect to be the first beneficiary of any form of commercialization arising from his or her work. However, distance-education institutions are in a better position than traditional ones to make the case for their entitlement to benefit financially from their employees' academic output. This is because a distance-education institution is essentially two types of organization in one. It is a teaching institution, but it is also a commercial publishing house. In producing and distributing course materials for the use of its students and in being drawn into agreements to share these materials internationally, the institution, as well as its academic authors, can expect to benefit from the revenues that accrue. So the development of distance-education courses is creating scope for a head-on conflict between university and college managements, on the one hand, and their teaching staffs, on the other, and for pressures to redefine the roles of the institution and its faculty in the distance-education process. Property rights agreements differ widely between institutions, and standardized versions of them in the international context may prove difficult to attain and impossible to monitor. The recent strike at York University, one of the longest in Canadian history, points to the strife that may lie ahead as institutions grapple with these issues.

The proliferation of the new multimedia technologies further complicates intellectual property and copyright issues, as ownership and usage of electronic course elements are even more difficult to define than those of print materials. Moreover, conventional publishing houses, which have their own plans to diversify in the educational market and their own commercial interests to protect, have begun to see distance-education institutions as their competitors and are increasingly reluctant to grant them access to the multimedia materials that distance-education teachers need for their courses.

Although information technology promises much, it will certainly deliver less if such problems are not resolved.

Bringing media to the people

Perhaps we have been dazzled by technology and have come to expect too much from it. Perhaps McLuhan unwittingly misled us when he suggested that the media are *extensions of people*; without people to use them well, that is, as *extensions of the media*, the machines are useless. In seeking to package our educational wares for the widest possible audience via bigger and broader media, such as television, we may have lost sight of the extent to which all learners are different and relish the ability to question and deny the ideas they are taught. For years, television producers have believed that the remote, impersonal nature of television could be overcome with the winsome use of this medium. Yet, the only provable failure of educational television, in its pre-Internet form, has been its inability to provide effective two-way interaction and continually adjust its content to the students' needs. Educational technologies can bring teaching and learning to a diaspora of students unable to access them otherwise, but the manner in which they have been used has fostered a one-way notion of teaching, rather than the ideal dialogue. It is therefore fortunate that the media as a whole are now converging and may emerge from their 20th-century chrysalis as a fully interactive supermedium for the years ahead.

But the new technologies will still need to be demystified for the benefit of those who wish to use them. The Canadian tradition of taking media, such as film and video, to the people has served this purpose well. It has exploited the major advantage of these media — their ability to make the images of the world more accessible — within a community-outreach framework that compensates for the technologies' lack of interactivity. In parts of the world that have not had access to high-technology infrastructures, simple media and ingenious techniques for their educational use are commonplace, and the traveling player–educator tradition has not died in these countries. So Canada and the developing world share a natural affinity for the process use of media in teaching, and both have a good opportunity to work together in developing the new multimedia. Neither has the economic resources to overcome the logistical problems that have obstructed the optimal use of earlier technologies, and each has something to offer the other in partnership.

Developing nations can take advantage of Canada's experience in planning and designing efficient technological infrastructures for distance education and producing and delivering high-quality educational courseware. Meanwhile, Canada can learn from the insights

its international partners developed before they had access to cost-effective educational technologies. Agencies such as COL and IDRC may be the first to identify the strategic alliances needed to shape the new technologies' effective global use, as they have a special knowledge of complementary national strengths and the development priorities simultaneously shared by diverse nations. Funding agencies are already welcoming the economic advantages of the Internet because as much as project partners may enjoy traveling to one another's country, they are forced to admit that much collaboration across the miles could be served by e-mail, file-transfer methods, and desktop conferencing.

Canadian universities still firmly believe that the most important justification for international cooperation is the opportunity for students to gain enrichment through travel (Knight 1995). But the universities can rest assured that communication technologies will not eradicate the need for international exchanges. These are needed in each discipline to provide training in the use of the new technologies and approaches; indeed, the major benefit of the communications technologies is their ability to help sustain projects in the long term. Canada will continue to share in the benefits of international exchanges, as it has throughout its history, and to apply its national expertise in areas such as instructional design, formative evaluation, and action research to help overcome the one-way modes of presentation all too commonly generated by current technologies.

Canada's expertise in the social uses of the media might not have been developed in the first place without the transfer of ideas from another nation. Significantly, this nation was the only one with an even larger political landmass — the former Soviet Union. Canada's "Challenge for Change" and "Fogo Process" projects were deeply influenced by, and built on, pioneering uses of media developed by young filmmakers such as Vertov and Medvedkin during the Russian Revolution. Indeed, in considering the educational-media practices of the last 40 years, one finds that Vertov initiated all those we have since identified as best practices, and none of the worst (James 1996a, b). His work provides a useful checklist of the instructional design, formative evaluation, and action-research principles to emulate in our attempts to bring the Internet, along with the next supermedium after that, to an international audience.

Opportunities for research and interchange, as well as for course provision, will be stimulated in this transnational melting pot. To permit the efficient transfer of learning and accreditation across borders, new subdisciplines, such as "prior learning assessment," are emerging,

and numerous private distance-education organizations are challenging the perception that the accredited university is the sole credible knowledge source. As the immediate needs of the developing world are for assistance in areas not emphasized in the traditional curriculum (for example, environmental studies, health education, and social marketing), conventional university expertise is no longer seen as being as relevant to transnational education as when education was geared to local interests. Carefully applied, the new media can be the basis for a world in which all types of educational experience are conveyed between nations, regardless of international boundaries, and can bring about the "death of distance."

Conclusions

New media, particularly the Internet, have the appropriate attributes to overcome the shortcomings of previous communications technologies. The Internet is a two-way, immediate, multimedia medium and has the capacity for communication on one-on-one, one-to-many, and many-to-many bases, regardless of distance. As long as we recognize the need to demystify the new media, maintain high-quality materials for them, and assist students in interpreting the diverse values they reflect, such technologies can truly bring about the death of distance in our educational efforts. They can also have profound effects on our educational planning, enabling us to scan the entire globe for partners with needs and priorities identical to our own. With luck, the focus of our attention will shift away from the differences that separate us regionally and toward the similarities that unite us internationally. Unless this shift is resisted, provincial and even national control over education and culture will become less relevant and increasingly unenforceable.

The breakdown of the old lines of demarcation may well cause bewilderment among educators. However, the new clusterings around special interests, problems, and needs for mutual support will be reassuring — even virtual support is more comforting than no support at all. Ultimately, the notion that Canada or any nation might have a distinctive role to play in the process of globalized education might become entirely obsolete. Canada may share with other nations new educational roles in diverse international communities. Or again, owing to Canada's unusual diversity, it may play a unique role in teaching the world how to use the communications media for tackling social ills.