

## Articles

### **DISTANCE EDUCATION FOR ADULT LEARNERS: DEVELOPMENTS IN THE CANADIAN POST-SECONDARY SYSTEM**

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#### ***Abstract***

*This paper traces recent developments in the design, development and delivery of distance education. It uses data from Statistics Canada's 1994 Adult Education and Training Survey to construct a profile of current provision by colleges and universities. Enrolments across a range of post-secondary programs are noted as is the use of different communication technologies. This overview and profile form the basis for a discussion of future directions in the post-secondary provision of distance education for adult learners.*

#### ***Résumé***

*Cet article examine les développements récents dans le monde de la conception, de la préparation et de la livraison d'activités de formation à distance. À partir des résultats de l'Enquête sur l'éducation et sur la formation des adultes (Statistique Canada, 1994), on esquisse un bilan de ces activités. On note que les inscriptions s'étendent sur un vaste éventail de programmes et que l'on fait appel aux technologies de toutes sortes. Cette ébauche constitue la toile de fond permettant de présenter les enjeux de la formation à distance en milieu post-secondaire.*

Governments are withdrawing their direct financial support for educational institutions, training programs, and students. As a consequence, individuals are required to assume greater responsibility for constructing their own pathways between school and work. Universities and colleges meanwhile are seeking alternative ways of meeting the rising demand for education and training programs while coping with funding cuts; many see distance education as a means of improving both accessibility and the quality of instruction offered to adult learners.

## 2 Sweet, "Distance Education"

In this paper, recent developments in the design, development, and delivery of distance education programs are traced; the emergence of student-centered instructional approaches is particularly noted. Using the *Adult Education and Training Survey* (Statistics Canada, 1994) the current status of post-secondary distance education provision for adult learners is described. Enrolments in college and university distance education programs as well as the use of various communications media in course delivery are profiled. This overview of developments in distance education and the analysis of the state of post-secondary distance education forms the basis for a discussion of institutional changes that necessarily follow adoption of distance education concepts and technology. These include organizational restructuring, new roles for faculty, and the implementation of entrepreneurial strategies to cope with increased program development costs. The implications of these changes are examined for individual students who, although they may benefit from improved distance education designs, also must bear the financial burden of the increased reliance on communications technology. In conclusion, research priorities consistent with the market orientation of post-secondary distance education for working adults are considered.

### **Changing School-Work Transitions**

Changes in the Canadian economy have encouraged and, in many cases, required people to return to school in order to upgrade their qualifications. The notion that one could obtain an initial or basic education and then proceed to a permanent position in the workforce has become outdated. The school-work transition process no longer is limited to the traditional passage from high school—or even from post-secondary education—to the workplace. It has instead come to involve a process of recurrent education in which work and learning are woven together throughout one's career (Thomas, 1993).

The personal obligation to plan for and finance advanced learning is reinforced by government attempts to increase employers' commitment to training while reducing their own financial involvement in post-secondary education (Mahon, 1990; Yates, 1995). Surveys have, however, repeatedly demonstrated the reluctance of Canadian business and industry to engage in employee training (Economic Council of Canada, 1992; Yalnizyan, Ide, & Cordell, 1994). As a consequence of the changing relationship between education and work, the task of negotiating successful transitions has

become largely an individual responsibility (Sweet & Anisef, 1997). This emphasis on individualism is seen in the work of Beck (1992) and Giddens (1994) who view social structures such as socio-economic status, gender, region, and ethnicity as exerting less influence over adult status attainment while the decisions and choices individuals make in negotiating the transition between school and work are decisive in determining their life chances. Others take a more moderate view of the relative effects of structure and individual agency on transition success. Furlong and Cartmel (1997), Rudd (1997), and Heinz (1991), for example, suggest that expressions of personal agency are qualified by social structures. All, however, acknowledge the greater risks associated with transition processes in post-modern economies.

Although Canadian employers and educational institutions have never coordinated the school-work transitions to the same extent as some other OECD countries (notably Germany or Japan), a post-secondary qualification in the past usually ensured access to reasonably attractive employment opportunities. Recently, however, Canadian post-secondary graduates are more likely to encounter significant periods of unemployment or under-employment (Anisef, Ashbury, Bischooping, & Lin, 1996). And, those who are employed must continually upgrade their skills through formal education if they are to retain or advance their positions (Gallagher, Sweet, & Rollins, 1997). The uncertain employment status of graduates from university and other post-secondary programs strongly suggests the need for a different, and more flexible, perspective on the role of educational institutions in helping students acquire the knowledge and skills needed for successful career building (Krahn, 1996).

It is the employed person seeking a post-secondary credential on a part-time basis who poses the greatest challenge to the existing post-secondary system. As Bates (1995) points out, the vast majority of those who need to upgrade are already in the workforce:

If every worker currently in the workforce was sent back to college for three months training every five years (a very conservative estimate of the average amount of job-based training required), the post-secondary education system in Canada, already one of the most comprehensive in the world, would have to increase by more than 50 percent. (p. 231)

Analysts such as Betcherman and Lowe (1997) and Scott (1994), who have examined both enrolment trends and the broader social and economic factors forcing change in the post-secondary system, call not only for greater

access of entry but also for improved access to learning environments that help develop the knowledge, understanding, and skills needed in the new economy. Universities and colleges play an important role in meeting the demand for professional and technical education (Cameron, 1997; Fisher, Rubenson, & Schuetze, 1994). However, traditional university and college programming—based on classroom instruction and organised around the term or semester—is a generally inappropriate form of provision for mature students, most of whom have job responsibilities and family commitments. The introduction of distance education at the post-secondary level is seen as essential to achieving the goal of improved educational opportunities for members of the active labour market (de Brouker, 1997; Burke, 1998).

### **New Approaches To Distance Education**

The history of distance education in Canada can be traced using three references. Mugridge and Kaufman (1986) provided a comprehensive account of the growth and development of distance education in Canada. Sweet (1989) concentrated on distance education research and development in Canadian post-secondary education institutions. Roberts and Keough (1995) included topics dealing with the relationship between education and work and introduced thoughtful analyses of the future of distance education based on technological developments in information and communications technology. The evolution of distance education described in these works suggests advances in the approach to design, development, and delivery of distance education that Kaufman (1989), Nipper (1989), and others describe as a process of generational change. Traditional correspondence instruction represents the first generation; second generation systems are essentially correspondence models augmented by telephone contacts between student and tutor. Third generation systems exploit the potential of communication technologies to construct more interactive and collaborative learning environments. Boot and Hodgson (1987) similarly describe technological advances in program delivery and changes in instructional design and student support as a shift from dissemination to development goals.

From the dissemination perspective, information is viewed as a commodity to be efficiently distributed; and, the instructional systems design process and the production of course packages which characterizes this approach are an efficient response to the imperative of providing wider access. These are characteristic of first and second generation distance

education programs designed to accommodate large numbers of students, but with a minimum of interaction and support.

Development approaches, by contrast, focus on conditions of learning that facilitate intellectual growth and the students' search for personal meaning through study. The learners' task is to understand the deep structure and meaning of their study materials rather than the reproduction of its surface organization (Garland, 1994). This more involved relationship between the learner and the curriculum is seen as requiring greater instructor involvement, as well as high levels of interaction and dialogue with other students. The organizational arrangements that support this approach involve a flexible curriculum sequence; negotiated objectives, learning methods and assessment; and a choice of student support services (Sweet, 1993).

Proponents of the development model typically stress the capacity of educational technology to increase the level of interaction among students and emphasize aspects of instructional design which foster collaboration and conversation among students (Jonassen, Davidson, Collins, Campbell, and Haag, 1995). The shift to a more learner-centered approach is discussed below in relation to the processes of program design, support, and delivery.

### *Design*

The instructional systems design model was for many years the principal approach to curriculum development in distance education. This was essentially a behaviourist approach in which student learning outcomes—defined as “instructional” objectives—were specified as the first step in the design of the learning activities and exercises necessary for independent study. Their development occupied the talents of a design team comprising, at a minimum, a content expert and an instructional designer. The product of these teams then was printed and packaged prior to being mailed to students. This industrial approach to design, development, and delivery remains in many quarters the accepted model of distance education provision. In recent years, however, considerable debate has surrounded the instructional systems design orthodoxy and from this debate alternative student-centred (development) approaches have emerged (Boot & Hodgson, 1987).

Underlying the development approach to instructional design are notions of constructivism. From a constructivist perspective, the educator views the student as an agent rather than a recipient in the educational transaction and in doing so makes certain assumptions about learners and the

learning process (Garrison, 1995). The first is that people define and come to understand new information, situations, or problems from their individual perspectives—they construct unique and personal meanings from their studies. Moreover, in this process of making meaning, they draw on previous learning and relevant experiences. Other features of a constructivist approach to instruction include an emphasis on active, participatory learning opportunities, a recognition of the importance of social exchange, and the public validation of knowledge. Learning also is seen as best conducted under conditions that most closely resemble those in which the knowledge or skills gained will be applied.

A concern for student autonomy underlies the constructivist approach. Dweck and Elliott (1983), for example, distinguish students by their orientation to performance goals or mastery goals. Those with performance goal orientations typically display behaviours that are externally oriented. Such students are more concerned that a difficult task might expose them to ridicule or overwhelm their ability. In contrast, mastery oriented individuals recognize that becoming more competent necessarily involves making mistakes; and, they see success as determined more by effort than ability. The profile of the mastery-oriented learner that emerges contains elements of an autonomous or agentic individual who possesses a clear notion of the responsibilities of an effective learner. From a somewhat different perspective, Garland (1994) assesses the motives of learners in relation to instructional content. The essential question is: Do they understand the underlying structure and gist of the instructional material or are they concerned primarily with acquiring only a superficial sense of its organization and detail? This notion of deep versus surface processing of instructional material is consistent with Marton and Saljo's (1976) view that students' approaches to learning are predispositions that are responsive to the specific conditions of learning in which the students find themselves. For example, multiple choice exam questions tend to elicit a surface study strategy aimed at reproducing information whereas opportunities to reflect upon and discuss curricular material incline students to seek the deep structure of substantive arguments and assign meaning to the materials' logic, organization, or provenance. In emphasizing the dispositional nature of the approaches concept, Marton and Booth (1997) argue that students must be conscious (or be made aware) of the features of specific learning situations that offer opportunities for reflecting on the deep structure of an

argument or for engaging in critical or evaluative thought. Similarly, Jonassen et al (1995) found that conditions which are conducive to a constructivist orientation foster student involvement. Learning should be active and engaging, rather than passive and receptive. Students should participate in an equitable way, whether this involves an on-line discussion or access to data bases. And learning transactions among individuals in a group should be collaborative.

Critics of the learner-centered design have questioned many of its underlying principles (e.g., Anderson, Reder, & Simon, 1996). In the case of computer-mediated instruction other, largely practical, concerns are noted. For example, there may be limits to the numbers of students who can be successfully accommodated or, at least, the number of individuals who can be offered interactive instruction across the entire range of courses that comprise their programs (Bates, 1996; Daniel, 1997). One of the advantages assumed from on-line learning is that it is free of the influence of personal characteristics that disadvantage people in face-to-face instruction—such as gender, disability, social status, or ethnicity. Mason (1999), however, points out that despite the anonymity of computer-mediated communication, personal difficulties among individuals still arise.

### ***Student Support***

Student support services are a part of all university campuses. They were initially seen as essential to the successful operation of Canada's first open universities. At the Tele-Universite in Quebec, Athabasca University in Alberta, and the British Columbia Open Learning Institute (now named the British Columbia Open Learning Agency) special student counselling sections were set up to advise and to encourage students who studied at home. The academic advising task was handled by a tutor who communicated by telephone with the student. In these dissemination models, the burden of instruction was borne by the course package, and was augmented by a tutor only when needed. Counselling typically was conducted quite separately from the instructional transaction.

In the more interactive situations made possible through the use of communications technology, the print package plays a subordinate role and the responsibilities of the tutor and counsellor tend to combine in the new role of facilitator to the students' learning. Nuy's (1991) studies of problem-based learning designs in distance education suggest that students not only need high levels of academic support but also varying amounts and kinds of

such support in less structured and more highly interactive environments. This underscores the importance of interpersonal and group communication skills—traditionally the competencies of the counsellor—in such settings, and emphasizes the need for a more direct role for academic advisors in the cooperative social structures generally associated with problem-based learning. The notion of combining the human relations skills of the counsellor with the academic qualifications of the tutor in the single role of facilitator seems a necessary feature of interactive systems, whether on-line or in study centres (Sweet, 1993). Furthermore, Bates (1996) points out that distance learners who are studying in the workplace require a different form and level of support than do those studying in their home, or those who are combining distance and on-campus instruction.

### *Delivery*

A student-centered approach to distance delivery involves a shift in assumptions about the successful learner's role. The independent learning of a prescribed curriculum requires skills such as note-taking, summarizing, and time management. Learning in an interactive environment requires the additional skills involved in exchanges with colleagues that promote curricular and personal understanding (Harasim, 1990; Harasim, Hiltz, Teles, & Turoff, 1995; Jonassen, 1991). The task of developing responsive delivery systems, then, is one of searching for particular media—or combinations of media—that can enable development of more effective conditions of learning.

There are basically three types of media that support distance learning: text-based, audio-based, and video-based (Mason, 1999). Bates (1995) proposed that developing new programs based on technology is in many ways a matter of matching specific learning tasks with appropriate media. Recent discussions in the literature on the characteristics of various media and their implications for instructional design and learning revolves around three dimensions: interactivity, asynchronicity, and convergence. All forms of electronic media have, over time, increased in their ability to support interaction—not just between student and teacher but among learners. Audio and video conferencing technologies are examples of media that can support discussions among groups of people, and can enhance these interactions with graphics and dynamic images. The ability of computer conferencing systems to be delivered asynchronously promotes both individual reflection on and group problem solving of study material. It also allows the effective



involvement of individuals from widely different time zones (or life styles). In addition to exploiting the unique features of individual media in an attempt to create interactive communities of learners (Anderson and Garrison, 1995), distance educators increasingly are combining media. This convergence is best seen in the web-based courses that are currently being offered, often in trial format. Using the standards and protocols that allow access to the internet, web courses integrate text, audio, and video media in ways that relieve the student of many of the arbitrary and frustrating procedures that characterized earlier computer-mediated systems. Moreover, web courseware allows access to the myriad resources of the internet.

Researchers in the distance education field continue to explore the various means of linking media with learning outcomes. This extends a well-established line of research that, over the years, has examined the question of whether or not media have unique effects on learning (Clark & Estes, 1999). Several research projects currently underway in Canada are aimed at further integrating media to promote complex learning outcomes. For example, the Virtual-U Project at Simon Fraser University is developing the software tools needed to establish a virtual university which can provide distance education students with access to computer conferencing, video conferencing, e-mail, and the information resources of the internet (Campos & Harasim, 1999).

### **The Status Of Distance Learning In Canada**

Several recent surveys have assessed the state of Canadian distance education provision at the post-secondary level. These provide an introduction and overview of the current state of distance activity among colleges, universities, and training firms in the business sector.

#### ***Recent Surveys of Distance Education Activity***

The Association of Canadian Community Colleges (1993) national survey of distance education developments in the community college systems found an absence of any strategic plan but evidence of individual institutions preparing to adopt and adapt a range of technologies. As well, there was an awareness of the need to develop faculty instructional design skills that are built on the availability of interactive technologies.

A second Canadian college survey was conducted under the sponsorship of the Commonwealth of Learning (McWilliams, 1994). The study reported case studies and results of a national survey of institutional policies and practices that included information on technology use. In order of use, the

media used were print, audio-conferencing, video-tape (in a course package), and computer-mediated communication. The study did not report whether this was limited to e-mail or whether it included computer conferencing.

Morris and Potter (1994) compiled a national overview of university continuing education departments which included a section on distance education dealing with finance, staffing arrangements, and perceived institutional support. Interestingly, only 11% of respondents indicated that they felt they had the full support of their institution.

Stahmer, Bourdieu, and Zuckernick (1992) surveyed the use of learning technologies by a variety of media developers, manufacturers, and communication carriers. In addition to outlining the telecommunications infra-structure in various sectors of the economy, their report included profiles of current learning technology projects. The report contains a number of recommendations for enhancing the Canadian technological base for educational courseware.

The Council of Ministers of Education Canada (1995) also commissioned a study of distance and open learning in Canada. Based on a summary of existing data and interviews with staff in institutions and government departments across the country, the report provides an outline of selected and representative activity, by province and provider system (e.g. post-secondary). The report also includes examples of pilot projects being conducted in all provinces.

These surveys are analyses of institutional policies and practices. While they outline developments in specific sectors of the post-secondary system or in particular regions of the country, none provides a nationally representative view of university and college distance education activity; nor do they indicate the range of media employed by these institutions in delivering their courses.

The exceptions are reports based on Statistics Canada's *Adult Education and Training Survey* (AETS) series which contains data from individuals involved in some form of post-secondary education or training but who are not members of the 18-24 year old, full-time student group. Burke (1998) and de Broucker (1997), for example, use AETS data to outline in broad terms the enrolment trends and organizational arrangements of Canadian post-secondary distance education.

### *A Profile of Distance Education Enrolments and Media Usage*

The 1994 Statistics Canada *Adult Education and Training Survey* offers one means of assessing the current status of distance learning in Canada, especially the use of interactive technologies. The following profile is based on the subset of 1994 AETS respondents of greatest interest to this study: the adult learner who is (a) employed or seeking employment and enrolled in an education or training program on a part-time basis; or (b) is on leave to study full-time before returning to the workforce. The weighted AETS sample represents some 1.4 million individuals. Those aged 17–24 who were enrolled full-time and not supported by their employers as well as those over 70 years of age were excluded from this analysis. The analysis also is limited to the post-secondary level: apprenticeship, trade-vocational, college, and university programs. These enroll the majority of post-secondary students. However, other providers (the proprietary sector is an example) are growing rapidly and their role in workplace training likely will increase as firms realize the value of retraining their employees. Another limitation in the analysis is the focus on programs—a sequence of courses leading to a degree, diploma, or certificate. Although many individuals take a single course in the process of upgrading, most enroll with the aim of gaining a credential of some kind (Stahmer, 1995). With these constraints in mind, two profiles are constructed to examine: (a) enrolments in traditional and distance programs at post-secondary institutions; and (b) the use of various delivery formats by these institutions.

Enrolments in traditional and distance education programs are shown in Table 1. Of the total enrolment of adult students (omitting those gaining an

Table 1. *Enrolments—Mode of Instruction by Program*

Program	Mode of Instruction					
	Traditional		Distance		Total	
	(No.)	(%)	(No.)	(%)	(No.)	(%)
Apprenticeship	95,097	94	6,315	06	101,411	100
Trade-Vocational	307,803	85	52,977	15	360,780	100
College	357,236	91	34,010	09	391,246	100
University	475,184	86	73,981	14	549,165	100
<i>Total</i>	1,235,320		167,283		1,402,602	

initial or foundational education), trade and university programs are most involved in distance education. It is possible to distinguish between the curricula of university programs and those of the other programs. Most colleges or institutes are involved in career and technical training and the school portion of most apprenticeships is done in colleges. The college role does, however, vary widely—CEGEP programs in Quebec offer the first two years of the university curriculum, as do community colleges in some other provinces; and in British Columbia several colleges have been designated as university-colleges with the ability to award baccalaureate degrees. Colleges appear to be adopting distance education policies less readily than universities, at least for their career-technical and university transfer programs. To some extent this reflects their regional mandates and the necessarily local student populations. Overall, distance education enrolments remain a minor although not insignificant part of formal, adult education in Canada.

Table 2 shows the extent to which various instructional formats are used in the different programs. Classroom and job-site instruction are examples of face-to-face instruction and illustrate the utility of seminars and workshops within the distance education approach. They also show that students are able to combine traditional and distance education courses within a degree or

Table 2. *Method of Delivery by Program*

Method	Program			
	Apprentice (%)	Trade (%)	College (%)	University (%)
Classroom	03	18	32	48
Job Site	38	08	23	06
Software	05	04	08	05
Radio/TV	—	—	—	08
Cassettes	18	15	16	25
Print	77	88	72	62
Mediated	12	12	25	22
<i>Enrolment</i>	6,315	52,977	34,010	73,981

Note: Table entries are percentages based on total possible response for each delivery method—i.e., the program (column) total.

diploma program. The software, radio/TV, cassette, and print formats are typically tied to second generation, dissemination approaches to distance education, with a minimum of student-instructor interaction. All are examples of independent forms of study rather than interactive forms. The latter generally are presumed to involve exchanges between and among people. The newer technologically supported methods are represented in the mediated category (see also Bernier, 1996).

Technologically mediated forms of instruction support interaction among instructors and students and represent the direction of future developments in distance delivery. At the time of the AETS survey, such forms of instruction constituted approximately one quarter of the college and university responses, which indicates the changing nature of distance education provision. However, the AETS data also suggest that most distance education providers in Canada are pursuing dissemination goals and operating what clearly are first or second generation systems—heavily dependent on the course package and independent learning supplements. This is not encouraging to a view of post-secondary education and training as being at the forefront of educational innovation. The development approach to distance education requires the use of broad-band media to construct interactive, student-centered learning environments. It may be that the necessary technology is neither widely understood nor generally available. Although all institutions have strategic plans, Fisher, Rubenson and Schuetze's (1994) analysis of university continuing education suggests these plans are not directed to as wide an audience as they might be. Furthermore, Pacey and Penny's (1995) critique of the post-secondary strategic planning process indicates that advanced communications technologies are a central part of the decision-making process in only some universities and colleges. From a more positive perspective, the level of interactive, mediated instruction that is in place may serve as a foundation for successful adoption of the newer curricular designs and technologies.

### **Innovation Issues for Post-Secondary Institutions**

If recurrent education is necessary in the emerging knowledge economy, or even in a moderately up-skilled one, access to appropriate learning resources is essential. Universities and colleges are being called upon to provide not only traditional undergraduate education but also increasing numbers of continuing professional education and technical upgrading programs. A basic shift in the nature of school-work transitions

was previously noted and discussed in relation to the concept of a risk society. These changes, coupled with other economic and social factors that contribute to social risk, are associated with the emergence of an educational marketplace. Technology, government cutbacks, and the growing presence of a private or proprietary sector signal the end of traditional forms of university or college provision (Morrison, 1995).

Where post-secondary institutions—largely through their continuing education divisions—have responded to the need for more accessible and relevant instruction by turning to distance education, they have had to address three concerns: institutional organization, faculty change, and the costs of installing and operating the communications technologies needed to create interactive learning systems.

### ***Institutional Organization***

With the exception of a small number of dedicated open universities and colleges (such as the Open Learning Agency in British Columbia, Athabasca University in Alberta, and the Tele-universite in Quebec) Canadian universities today remain largely campus-based institutions organized around academic departments with a tradition of providing initial or foundational education for youth and professional programs for graduates. Colleges have a different curricular mandate but are organised in a similar manner. Both now are attempting to serve the learning needs of many adult, part-time students using, for the most part, traditional classroom methods. Although these programs are no longer entirely bound by notions of course or semester they have distinct limitations in meeting the requirements and preferences of adult learners. Distance learning approaches employing interactive instructional technology have the potential to dramatically increase the scope of this provision

The term dual-mode institution—that is, one which serves both on-campus and off-campus students—describes the current situation at most Canadian universities and colleges. These activities are, however, seen as quite separate from the established classroom model of delivery. Such a distinction is unlikely to be sustained. Bates (1996) describes a process of convergence between distance and classroom learning as a consequence of the pervasive influence of instructional technology. Moran and Myringer (1999) ascribe convergence to a broad range of factors, many initiated from the traditional side of the dual-mode institution. The adoption of flexible delivery strategies both on and off campus are attempts to accommodate the

personal situations of the adult learner. Flexible learning is proposed by Moran and Myringer (1999), Guiton (1999), and others as a term that recognizes the convergence of classroom and distance education provision. King (1999) further describes flexible learning in terms that parallel those applied to a development approach to distance education:

The move to flexible delivery is discernible across the university system. By flexible delivery I mean the provision of learning resources and the application of technologies to create, store and distribute course content, enrich communication, and provide support and services to enable more effective management of learning by the learner. In particular, the concept involves a view of learning in which the teacher does not predominantly mediate the student's experience. (p. 271)

The AETS data suggest that post-secondary institutions will continue to approach distance education in different ways and with varying levels of enthusiasm. There is, however, growing pressure from students who wish their institutions to become more flexible in their provision. Increasing numbers of part-time students are enrolling in short intensive instruction courses offered through summer institutes or weekend colleges (Scott & Conrad, 1992). Many full-time, on-campus students are accessing the internet and communicating with their professors by e-mail.

The process of convergence in the move toward more flexible forms of post-secondary education is consistent with the emergence of the virtual university or college. Bates (1995) lists some of the responsibilities of an electronic educational institution, many of which depart from current post-secondary practice: (a) provide information on educational and training needs and opportunities; (b) provide accreditation through brokering credits and prior learning assessment service; (c) develop coherent curricula and multi-media material; (d) provide an import-export service for multi-media learning materials; (e) conduct research and undertake program and media evaluations.

This image of the future post-secondary education institution includes a number of new roles for universities and colleges: they may function as a facilitator or broker within a global, distributed learning network; they may function as the provider of a full program to their "own" students using multimedia materials; or they may function as a multimedia reference library. Existing institutions are already moving in these directions and, to a

greater or lesser extent, are becoming more flexible in their policies and practices (Morrison, 1995). The Virtual-U initiative at Simon Fraser University is one such example. As described by Campos and Harasim (1999), this research and development project is a web-based learning environment customized for the delivery of on-line education. The software that defines this system comprises communications or conferencing routines linked to a variety of pedagogical resources that allow considerable scope for student initiative in deciding the learning sequence. Much of the controversy surrounding the adoption of such technologically driven approaches to instruction is a perceived threat to the autonomy and prerogatives of faculty.

### *Faculty Change*

There are significant implications for faculty in the shift towards development (student-centred) approaches to instructional design and flexible provision. Allowing students to negotiate the content of their program recognizes what Guiton (1999) describes as adult learners' and professionals' increasing need to direct their own upgrading and changes in career direction. Faculty face changed curricular responsibilities in the design of distance education courses (Beaudoin, 1998). And they acquire new teaching and counselling responsibilities in mediated instructional systems (Brindley, 1995; Sweet, 1993). These concerns apply to both college and university faculty although faculty involvement is uneven in both sectors of the post-secondary system. At the present time, much of the distance education activity at universities is centered in their continuing education departments. This situation is changing, however, as universities move towards more flexible forms of provision and require faculty in the various disciplines and departments to employ information technology more generally in their instructional duties (Fisher, Rubenson, & Schuetze, 1994). At least three different futures for faculty are envisioned.

Moran and Myringer (1999) suggest faculty will play an important role in the transactions between the learning system and the student. As a result, one of the priorities of the electronic university or college is the development of faculty skills in instructional design and in their ability to interact effectively with students in a multi-media learning environment. Many university and college instructional development departments are combining with computing centre personnel to prepare faculty. Beaudoin (1998) points out that faculty will retain their importance in the distance learning situation. However, their curricular task will involve team work with educational



technologists and designers; and their instructional task will require orchestrating the various information resources available to students who have access to the internet.

Others offer a different, less optimistic view of the future for faculty. For example, in the electronic institution outlined by Bates (1995) many of the resource people involved in course design will not be faculty members of the university or college but contract workers—media designers; specialists from business, industry, and government; or instructors from some other educational institution. In this changed employment picture, a number of observers anticipate a difficult transition for faculty. Noble (1998), for example, sees the faculty diminished by the commodification of knowledge and of the entire educational process:

The major change to befall the universities over the last two decades has been the identification of the campus as a significant site of capital accumulation, a change in social perception which has resulted in the systematic conversion of intellectual activity into intellectual capital and, hence, intellectual property. (p. 13)

Where knowledge is conceived of as intellectual capital, its construction and distribution are not likely to be consistent with the traditional manner in which faculty discharge their responsibilities of research, instruction, and community service. Others such as Axelrod, Anisef, and Lin (1999) are concerned about the future of the disciplines to which students are introduced by faculty members. The liberal arts curriculum—as a prerequisite to university professional programs—is seen as important to the effectiveness of the workforce as well as to the well-being of its individual members. For these critics, current trends toward vocationalizing and commodification of the university curriculum represent a threat to the entire institution.

A third perspective is offered by those who see the university as more resilient and less susceptible to the immediate imperatives of government, business, or technology. Based on information gathered through the Campus Computing Project, Green (1999) suggests that although significant changes in faculty roles may be anticipated, the rate of change will be gradual. This more controlled, evolutionary view is in many ways consistent with the AETS data. Canadian post-secondary institutions appear to be moving toward mediated forms of instruction at a modest, regulated pace. However, the degree of involvement with technology and distance education may not

be a sure guide to the future, especially if the public post-secondary institutions face significant competition from the proprietary sector.

### *The Costs of Technology Adoption*

Although organization and faculty matters are critical to the successful implementation of distance learning designs and associated technologies, both are manageable problems. Of perhaps greater concern is the matter of cost. The analysis of the AETS data indicates the reluctance of many post-secondary institutions to make a strong commitment to technologically mediated systems. Although there may be several reasons why a particular institution would adopt a cautious approach, the design, development, and delivery of interactive programs are expensive processes (Green, 1999). Bates (1995) has outlined cost-benefit gradients for the various media that comprise a comprehensive tele-communications network for university or college use. Similar analyses have been conducted by Cukier (1997), Hulsmann (1999), and others. All confirm the considerable initial (startup) costs. At the same time, they demonstrate returns on these investments through improvements in students' ability to interact and establish on-line the community of learners so important to advanced study (Anderson & Garrison, 1995). Recent evaluations of computer-mediated programs by Rumble (1997) indicate the complexities—and often unanticipated costs—of technologically based instruction. Several universities and colleges nevertheless have adopted sophisticated communications technology to deliver interactive courses.

One of the strategies employed in maximizing institutional resources involves collaboration between institutions. Various sharing arrangements have been attempted and in some cases have worked well (Moran & Mugridge, 1993). Collaboration among colleges and among universities likely will continue to develop and, for many institutions, may provide the economies needed for program development.

Public post-secondary institutions in Canada are to some extent driven by the threat of competition from entrepreneurial U.S. universities and proprietary institutions (Association of Universities and Colleges of Canada, 1998; Sweet, 1991). At the same time, businesses themselves are undertaking advanced training with the aid of tele-communications and student-centered designs for learning. In many cases these programs are marketed to other companies in need of advanced training for their employees (Hall, 1997).

The economics of the electronic university or college are such that some form of partnership between public institutions and the private sector may be necessary for all but the largest and most well-endowed university. Involvement in for-profit ventures may not be as alien to the post-secondary community as some might argue, especially the college sector and the continuing education divisions of universities. In fact, most Canadian universities and colleges currently are pursuing both cost-recovery and profit-making policies through their adult and continuing education programs (Knowles, 1996; Sweet & Gallagher, 1998). And some have formed partnerships with hardware manufacturers to equip instructional centres and distance education communications systems (Association of Universities and Colleges of Canada, 1998).

### *Implications for Students*

To the extent post-secondary cost-recovery programs and partnerships with business and industry exacerbate the current trend toward viewing students as consumers—who are obliged (but not always able) to pay for the necessary communications technology—the ideal of accessible education may not be well served. As an extensively wired country, Canada can offer its citizens the benefits of technologically based distance learning at the post-secondary level. But it can do so equitably only if existing social and economic disparities are taken into account. Adoption of a wholly market approach to materials development and program dissemination may appeal to a commercial market, comprising individuals and groups with sufficient wealth to afford the hardware, software, and connection charges associated with being on-line. However, another, social market is made up of individuals who are disadvantaged in some way and may be effectively excluded from mediated learning (Bates, 1997). These include many members of the marginalised groups identified in various labour market adjustment policy initiatives: women, First Nations peoples, visible minorities, and disabled persons (Mahon, 1990). More generally, this social market includes all those who are unable to afford the telephone connections, personal computer, and associated software, or the necessary training in their use. Participation by these individuals in post-secondary education is a social imperative as well as an economic necessity. Unfortunately, government policies of financial restraint restrict the ability of colleges and universities to accommodate these students (Armstrong, 1998). Reductions in funding lead to entrepreneurial behaviour and market responses; the resultant

commodification of post-secondary programming runs counter to traditional priorities of equity and accessibility. A lack of money is not, however, the only causal factor in the changing post-secondary environment. Technologically mediated instruction may be a response to government cutbacks but technology itself contributes to the process of change in post-secondary education. Because of the ability of institutions—whether public or proprietary—to offer on-line courses virtually anywhere, the regional mandate (and hegemony) of universities and colleges has begun to slip. They can no longer count on the support of the traditional student body; nor can they count on the allegiance of adult learners in their communities. Both institutions and individuals are operating in an increasingly active educational marketplace.

The analysis of the AETS data suggests that universities and colleges are not turning to technology with any particular urgency; however, this process likely will accelerate in the near future. Where access to appropriate conditions of learning—represented by technologically mediated systems—are increasingly the responsibility of the individual and increasingly expensive, colleges and universities are presented with the dilemma of balancing access, instructional quality, and cost. The solution seemingly is to have the educational consumer bear these costs. In an important sense, this contributes to the level of social risk facing individuals as they attempt to form viable pathways between education and work. Interactive systems can improve instructional quality and they may enhance access for some; but for many others, they likely will limit participation.

### **Future Research Directions**

Access to advanced learning—and, more specifically, to the conditions of learning needed to benefit from instruction—is costly. It seems unlikely that public institutions can continue to raise fees in both their undergraduate, professional, and continuing education programs without restricting access to high-quality instruction. Increasingly, however, they are adopting a market orientation in their provision of distance education. A better understanding of the dynamics of entrepreneurship among public post-secondary institutions and their impact on students could be found by studying the proprietary training schools and private universities. Such research would increase distance educators' understanding of the operating principles and practices of these institutions and provide a more informed basis for predicting the impact of privatization on access and instructional quality in the public

domain. Some analyses of the proprietary training schools and descriptions of for-profit universities are available (Association of Universities and Colleges of Canada, 1998; Sweet, 1996). These, however, provide only a preliminary view of the possibilities (and limitations) associated with post-secondary entrepreneurship.

A second area of research could involve further examination of the costs and benefits of pooling resources. Collaboration among public distance education institutions is well established in Canada, and has been discussed to some extent in the higher education literature (Moran & Mugridge, 1993). Partnerships between public post-secondary institutions and business and industry are growing. These take various forms, including contract work, special training programs, and cooperative education. Other arrangements include private sector contributions of technology to universities and colleges. Although some of these collaborations have been examined and reported in the literature (e.g., Noble, 1998; Privateer, 1999), little is known of the long term outcomes of such alliances.

Other areas of research also could contribute to a better understanding of the adoption of distance education by universities and colleges. Issues of institutional flexibility and faculty involvement suggest their own research priorities, as do cost-benefit analyses of media types and their application. Research involving for-profit institutions and the nature of collaboration between public and private sectors is proposed as an important addition to these efforts.

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