Survey of Distance Learning Provision in Continuing Health Professional Education in Canada

Vernon Curran, Memorial University of Newfoundland
Fran Kirby, Memorial University of Newfoundland
Lisa Fleet, Memorial University of Newfoundland

ABSTRACT

In Canada, the trend is towards greater use of distance learning technologies in the provision of continuing professional education in the health professions. Lack of access to professional development is a common deterrent to practice in rural and remote areas. Distance learning technologies have an important role to play in address-

RÉSUMÉ

Au Canada, la prestation des programmes en éducation permanente pour les professions de la santé semble se diriger vers un plus grand usage des technologies d'apprentissage à distance. Le manque d'accès au développement professionnel est une dissuasion commune à la pratique, et ceci particulièrement dans les

ing the professional isolation challenges experienced by rural and remote health care providers.

This article examines the state of distance learning provision among Canadian providers of continuing health professional education. The survey population included academic institutions, national/provincial health professional associations and non-profit health advocacy organizations, the pharmaceutical industry, and hospital/health care authority organizations. The results provide a greater understanding of the state of distance learning provision among providers of continuing health professional education in Canada and suggest a number of means to foster distance learning opportunities for rural health care providers.

régions rurales et éloignées. Les technologies d'apprentissage à distance jouent un rôle important en relevant les défis se rapportant à l'isolement professionnel éprouvé par ces mêmes fournisseurs de soins de santé.

Cet article fait l'examen de la situation actuelle de la prestation des programmes d'apprentissage à distance parmi les prestataires canadiens offrant des programmes d'éducation permanente pour les professionnels de la santé. La population sondée comprend des établissements d'enseignement supérieur, des associations professionnelles de santé nationales et provinciales, l'industrie pharmaceutique, et des organisations de soins de santé. Les résultats nous offrent une plus grande compréhension de la situation de prestation des programmes d'apprentissage à distance se trouvant à l'intérieur des professions de santé au Canada. Aussi, les résultats nous suggèrent-ils de nombreuses façons pour favoriser les possibilités d'apprentissage à distance pour les prestataires de soins de santé habitant en milieu rural.

INTRODUCTION

The provision of an equitable and sustainable level of health care in rural and remote communities has been a challenge for the Canadian health care system for some time (Hutten-Czapski, 1998; Rourke, 1997; Tepper & Rourke, 1999). Rural communities have suffered from a chronic shortage of health care providers for many years (Ramsey, Coombs, Hunt, Marshall, & Wenrich, 2001). The obstacles and deterrents to recruiting and retaining rural

health care providers are multi-faceted and include familial and personal issues, reimbursement and workload factors, underfunded hospital services, professional isolation, and lack of professional development opportunities (Rourke, 1993, 1994). The lack of professional development opportunities for rural health care providers is particularly troublesome for Canadians and provincial/territorial/federal government policy-makers in their effort to ensure health-system goals of safe, timely, equitable, accessible, and current provision of health service for rural Canadians.

Rural health care is both demanding and challenging. Rural health care providers frequently practise in an isolated environment with inadequate resources and limited or distant specialist back-up resources. Several studies have confirmed the existence of unique continuing professional education needs among rural health care providers (Gill & Game, 1994; Kamien & Buttfield, 1990; Malay & Moore, 2002; Rourke, 1988; Woolf, 1991). Due to the isolation and nature of rural health care, rural practitioners must often maintain a level of clinical competence beyond that of their urban health care peers. Rural physicians are often expected to perform a generalist role in every aspect of clinical practice, which requires them to develop and maintain a special base of knowledge and technical skill in a variety of clinical areas, particularly those related to rural medicine—emergency medicine, obstetrics, and anesthesia. The continuing professional education needs of rural and urban health care providers also differ (Lott, 1995; Rosenthal & Miller, 1982; Woolf, 1991). The practice of rural physicians or rural nurse practitioners often covers a broader array of service provision than that of urban practitioners. Rural doctors carry much greater responsibility and practise a wider range of clinical and procedural skills in an environment with restricted access to health professional support (Hamilton, 1995; Hays, Gupta, & Arlett, 1994; Pope, Grams, Whiteside, & Kazanjian, 1998; Wise et al., 1994). In addition, rural populations are older, poorer, sicker, less educated, and often perceived as having a lower level of health than urban populations (Rourke, 2000). The aging of the rural population places a significant demand on the resources of the health care system. In rural areas with a small hospital, the rural physician's scope of practice can include office-based family practice, house calls and nursing home visits, and hospital-based medicine. This work is usually supplemented by emergency-medicine shifts, obstetric deliveries, and sometimes general practice anesthesia (Rourke, 1997).

Rural physicians and other rural health care providers have been reported to perceive their opportunities for participation in traditional continuing health professional education as inadequate (Gill & Game, 1994; Lott, 1995; Rosenthal & Miller, 1982; Woolf, 1991). Bhatara, Fuller, O'Connor-Davis, and Misra (1996) suggested that rural physicians' sense of professional

isolation, due to a lack of continuing education opportunities, influences their feelings of job dissatisfaction with rural practice. Nurses in rural communities also encounter several barriers to participation in professional development and continuing nursing education programs. According to Treloar (1985), for many rural nurses it is very costly to travel to high-quality continuing education programs. This is particularly true in areas where travel is seasonally restricted due to climatic conditions or where educational resources are sparse or poorly distributed. Staffing and financial constraints also restrict the number of rural nurses that health care agencies can send to outside courses (Clark & Cleveland, 1984). Providers, as well, are often limited as to the number of workshops they can present in multiple locations throughout a large geographic area. DeMuth (1996) reported that the major barriers for pharmacists' participation in continuing education were related to time constraints, job constraints (such as lack of relief staff), the scheduling and location of group learning, and family commitments. One of the greatest barriers for rural pharmacists was the centralized location of most face-to-face continuing pharmacy education programs.

Traditional methods of providing instruction and educational support to groups gathered in one central place do not meet the needs of rural health care providers (Twigg & Brennan, 1991). However, using information and communication technologies to provide distance learning can reduce the isolation and enhance the lifelong learning opportunities available to rural health care providers (Zollo, Kienzle, Henshaw, Crist, & Wakefield, 1999). Historically, audio teleconferencing, videoconferencing, slow scan imaging, and other media and technologies have been used to facilitate distance learning for rural health care providers (Armstong, Gessner, & Cooper, 2000; Billings, Ward, & Penton-Cooper, 2001; Black & Dunikowski, 1985; Davis & McCracken, 2002; Dunn, Acton, Conrath, Higgins, & Bain, 1980; Lindsay, Davis, Fallis, Willison, & Biggar, 1987; McDowell et al., 1987). In recent years, Internet-based technologies have enabled the delivery of a more convenient and flexible form of distance learning support (Curran, Hoekman, Gulliver, Landells, & Hatcher, 2000; Peterson, Galvin, Dayton, & D'Alessandro, 1999; Richardson & Norris, 1997; Ryan & Waterson, 2000; Turchin & Lehman, 2000). Moore and Kearsley (1996) described distance learning as:

> planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. (p. 2)

Several studies have examined the use of distance learning technologies among North American health professional education providers. Potempa et al. (2001) surveyed members of the American Association of Colleges of

Nursing to determine the state of the art in distance learning technology use. Their results indicated an increase in course offerings through distance learning technologies. Carriere and Harvey (2001) also conducted a Web-based survey of North American continuing medical education providers and the distance learning technologies they employed. Their results suggested that the majority of providers had not developed distance education programs.

The purpose of the study considered here was to examine the state of distance learning provision among Canadian continuing health professional education (CHPE) providers. A greater understanding of how CHPE providers utilize distance learning technologies to address the professional development and lifelong learning needs of health care providers has important implications for the Canadian health care system.

METHODOLOGY

A questionnaire-survey was distributed to CHPE providers in Canada. The survey questions were developed from a review of relevant literature (Carriere & Harvey, 2001; Collis, Peters, & Pals, 2000; Potempa et al., 2001); Table 1 provides a summary of the questionnaire themes. The survey was validated by an advisory committee of experts in continuing professional education and distance learning, and a draft of the questionnaire was piloted with several health professional educators. A total of N = 3,044 surveys were distributed to a variety of CHPE providers in Canada between September and December 2002.

Table 1: *Survey Question Themes*

- the type of organization to which respondents belonged
- the organization's commitment to the provision of continuing professional education programming by distance learning
- experience in distance learning program delivery to health professionals
- factors influencing decision to offer distance learning programming
- source(s) of support for distance learning program delivery and access to internal resources to support distance learning program development and delivery
- type(s) and nature of partnerships formed for the purpose of sharing resources for distance learning program development and delivery
- type(s) of technologies used in delivering distance learning programs to health professionals
- type(s) of faculty development provided to support instructors and faculty in distance learning program development and delivery
- composition of target audience/participants in distance learning programs
- factors influencing likelihood of use of information and communication technologies for continuing professional education

The survey population included academic institutions (schools of medicine, nursing, and pharmacy), national/provincial health professional associations and non-profit health advocacy organizations, the pharmaceutical industry, and hospital/health care authority organizations. The national/provincial health professional associations' category included national and provincial associations for nursing, medicine, and pharmacy practitioners and professional societies representing medical specialties. The hospital/health care management boards' category included hospitals; regional district health authorities and boards; retirement, nursing, and long-term-care facilities; and various health centres (e.g., rehabilitation, children, mental health). Table 2 provides an overview of the respondent categories, respondent population size, and the response rates. Surveys were coded and analyzed using the Statistical Package for the Social Sciences (SPSS 11.0 for Windows).

Table 2: *Respondent Categories*

Respondent Category	Respondent Population	Respondents (Response Rate)
Academic Institutions		
Schools of Nursing	N = 135	58 (43.0%)
Schools of Medicine	N = 16	10 (62.5%)
Schools of Pharmacy	N = 9	5 (55.6%)
National/Provincial Health Professional Associations	N = 101	47 (46.5%)
Pharmaceutical Industry	N = 56	15 (26.8%)
Hospital/Health Care Management Boards	N = 2,727	542 (19.9%)

RESULTS

Distance Learning Provision

Table 3 presents results pertaining to the provision of distance learning programming. The majority of school of nursing (55.2%) and school of medicine (70.0%) organizational respondents reported providing distance learning programming, while the majority of school of pharmacy (80.0%), national/provincial health professional association (65.2%), pharmaceutical industry (73.3%), and hospital/health care management board (78.9%) respondents indicated that they did not provide this type of programming. Schools of nursing and medicine reported the greatest level of experience in the delivery of distance CHPE programming. The majority of school of nursing respondents (59.4%) reported offering distance learning programming for six or more years, as did 42.9% of school of medicine respondents.

Table 3: *Summary of Providers of Distance Learning Programming to Health Professionals*

Type of Organization	Yes		No		TOTAL
	N	%	N	%	
School of Nursing	32	55.2%	26	44.8%	58
School of Medicine	7	70.0%	3	30.0%	10
School of Pharmacy	1	20.0%	4	80.0%	5
National/Provincial Health Professional Association	16	34.8%	30	65.2%	46
Pharmaceutical Industry	4	26.7%	11	73.3%	15
Hospital/Health Care Management Board	114	21.1%	426	78.9%	540

Reasons for Offering Distance Learning

Table 4 presents results pertaining to factors that influenced respondents' organizational decision-making in the area of distance learning. The majority of school of nursing and school of medicine respondents indicated that the factors having the greatest influence on their decision to offer distance learning programming included: "addressing CHPE needs of rural/remote health professionals"; "increasing opportunities for flexible CHPE access"; and it was "part of the organization's mission." Interestingly, only a minority of respondents across the organizational categories indicated that "increasing revenue" influenced their decision to offer distance learning programming, and only a small number of the academic organizational respondents indicated that "less expensive delivery modality" influenced their decision. In contrast, a majority of hospital/health care management board respondents (60.5%) indicated that "less expensive delivery modality" significantly influenced their decision to offer distance learning. As well, 43.0% of hospital/health care management board respondents reported that "addressing mandatory CE needs of health professionals" was an important factor.

Sources of Support

The majority of school of nursing respondents reported that "tuition/registration fees" (78.1%) and "provincial government grants" (50.0%) were the main sources of support for their distance learning programming. "Industry educational grants" were reported by 71.4% of school of medicine

Table 4: *Factors Influencing Organizational Decision to Offer Distance Learning Programming*

Organizations		Part of organization's mission		Increase revenue		Address CHPE needs of rural/remote health professionals		Increase opportunity for CHPE access		Address mandatory CE needs		Less expensive CHPE modality		Don't know	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
School of Nursing	Yes	17	53.1%	7	21.2%	26	78.8%	24	70.6%	5	15.6%	5	15.6%	0	0.0%
	No	15	46.9%	26	78.8%	7	21.2%	10	29.4%	27	84.4%	27	84.4%	32	100%
School of Medicine	Yes	4	57.1%	1	14.3%	6	85.7%	5	71.4%	2	28.6%	1	14.3%	0	0.0%
	No	3	42.9%	6	85.7%	1	14.3%	2	28.6%	5	71.4%	6	85.7%	7	100%
School of Pharmacy	Yes	0	0.0%	0	0.0%	1	100%	1	100%	1	100%	0	0.0%	0	0.0%
	No	1	100%	1	100%	0	0.0%	0	0.0%	0	0.0%	1	100%	1	100%
National/Prov. Health Professional Association	Yes	5	31.3%	1	6.3%	14	87.5%	16	94.1%	5	31.3%	8	50.0%	0	0.0%
	No	11	68.8%	15	93.8%	2	12.5%	1	5.9%	11	68.8%	8	50.0%	16	100%
Pharm. Industry	Yes	2	50.0%	0	0.0%	2	50.0%	4	100%	1	25.0%	2	50.0%	0	0.0%
	No	2	50.0%	4	100%	2	50.0%	0	0.0%	3	75.0%	2	50.0%	4	100%
Hospital/Health Care Management Board	Yes	49	43.0%	6	5.3%	70	61.4%	66	57.4%	49	43.0%	69	60.5%	3	2.6%
	No	65	57.0%	108	94.7%	44	38.6%	49	42.6%	65	57.0%	45	39.5%	111	97.4%

respondents as a main source of support for their distance learning programming, and 45.0% of hospital/health care management board respondents indicated that a "parent institution grant/subsidy" was a main source of support for their organizations.

The majority of respondents from the organizational categories of schools of nursing, schools of medicine, health professional associations, and hospital/health care management boards reported that they had formed partnerships. The most significant type of partnership was formed with other educational institutions, and it was the major type formed by 59.1% of school of nursing respondents, 66.7% of school of medicine respondents, 66.7% of health professional association respondents, and 67.1% of hospital/health care management board respondents. Only 33.3% of school of medicine respondents indicated that a partnership with other departments in the parent institution was a major type of partnership for them. Partnerships with provincial and federal government organizations and community-based agencies were not identified as significant by the majority of respondents or across the organizational respondent categories.

Distance Learning Technologies

Table 5 provides results related to the types of distance learning technology used by Canadian CHPE providers. The main technologies used by the majority of respondents included electronic mail (61.4%), Web-based education (59.9%), videoconferencing (59.2%), correspondence materials (57.2%), videotapes (52.0%), and audio teleconferencing (51.5%). The majority of schools of nursing and medicine respondents also indicated that they provided training and support to faculty and instructors who taught in their distance learning programs. "Faculty development seminars/workshops," "instructional development support materials," "mentoring by experienced instructors," and "one-on-one consultation with an educational specialist" were the main types of faculty development activities that were reported by the majority of respondents across the organizational categories.

Table 5: *Types of Distance Learning Technologies Used*

Technologies Used	N	%	Total
Electronic mail	105	61.4%	171
Web-based education	103	59.9%	172
Videoconferencing	103	59.2%	174
Correspondence materials	99	57.2%	173
Videotapes	89	52.0%	171
Audio teleconferencing	88	51.5%	171
Interactive multimedia CD-ROMS	59	34.1%	173
Fax	55	32.2%	171
Computer conferencing	44	25.7%	171
Audio cassette	36	21.1%	171
Web broadcasts	34	19.9%	171
E-mail list servs	25	14.6%	171
Interactive videodiscs	17	9.9%	171
Cable/broadcast TV	10	5.7%	174
Audiographic teleconferencing	7	4.1%	171
Radio	2	1.2%	172

Characteristics of Distance Learners

Table 6 presents results pertaining to the characteristics of the distance learning audience that took part in respondents' CHPE programming. The main audiences identified across the organizational categories were "regional" and "provincial." The majority of respondents across all organizational categories reported that participants in their distance learning programs were not predominantly recent university graduates. Rather, 66.7% of school of medicine respondents and 51.0% of hospital/health care management board respondents indicated that participants in their distance learning programs were predominantly rural practitioners. Of school of nursing respondents, 55.2% indicated that their audience encompassed an even mix of rural and urban practitioners. Finally, 85.7% of school of nursing respondents, 72.2% of health professional association respondents, and 64.2% of hospital/health care management board respondents indicated that their participants did not require continuing education credit to maintain licensure.

Table 6: *Location of Distance Learning Audience*

Type of Organization	Location of Audience								Total
	Regional		Provincial		National		International		
	N	%	N	%	N	%	N	%	
School of Nursing	25	32.5%	24	31.2%	16	20.8%	12	15.6%	77
School of Medicine	3	18.8%	7	43.8%	4	25.0%	2	12.5%	16
School of Pharmacy	0	0.0%	1	50.0%	1	50.0%	0	0.0%	2
National/Provincial Health Professional Association	3	15.0%	11	55.0%	6	30.0%	0	0.0%	20
Pharmaceutical Industry	1	25.0%	2	50.0%	1	25.0%	0	0.0%	4
Hospital/Health Care Management Board	82	61.2%	38	28.4%	10	7.5%	4	3.0%	134

Influence of Organizational Factors

A Mann-Whitney analysis was conducted on responses related to perceptions of organizational factors. These "organizational factor" items were adopted and modified from the work of Collis, Peters, and Pals (2000). In their work, Collis and colleagues developed a model for predicting an individual's likelihood of using a learning technology application in teaching practices. A scale of organizational factors was found to influence this likelihood. The Mann-Whitney analysis revealed that organizational respondents who indicated they provided distance learning reported a higher score on the organizational factor scale ($p = 0.000$). Organizational units reporting access to the resources of a distance education division also reported a higher score on the organizational factor scale ($p = 0.020$). Organizational units reporting that they had formed partnerships for the purposes of distance learning development and delivery ($p = 0.005$) and those reporting that their parent institution offered distance education courses ($p = 0.024$) also reported a higher organizational influence score.

A "strengths and resources scale" was also developed to measure the influence of various factors on the use of distance learning technologies in CHPE delivery. The results of Mann-Whitney analyses for "adequate telecommunication infrastructure" ($p = 0.048$), "adequate facilities/equipment for supporting distance education development and delivery" ($p = 0.001$), "convenient personal Internet access among target audience" ($p = 0.022$), and "convenient personal computer access among target audience" ($p = 0.042$) indicated significant differences between providers and non-

providers of distance learning programs. The perception of infrastructure and access to equipment and Internet services were more positive among those organizations providing distance learning. These providers also reported higher mean scores on items related to experience, enthusiasm, and sufficient time commitment among the target audience.

CONCLUSION/FINDINGS

Physicians and nurses comprise not only the largest health professional groups in the country but also the largest groups in rural and remote regions of Canada. The survey results suggested that Canadian schools of medicine and nursing are responsible for a significant amount of the distance learning programming that is being provided to these health professionals. The results also indicated that schools of nursing and medicine report the greatest level of experience in distance CHPE. Existing learning technology resources and expertise (human, technical, and infrastructure) within an organization are important factors influencing the likelihood that a CHPE provider delivers distance learning programming. The majority of nursing and medical schools that indicated involvement in distance learning also reported that their parent organization offered distance education courses and that they had access to distance education resources.

Factors related to "financial gain" did not appear to have a significant influence on the decision of academic CHPE providers to offer distance learning. These providers indicated they were more likely to offer distance CHPE as a means to address the needs of rural/remote health professionals, increase opportunities for flexible CHPE access, and fulfill their organization's mission. In contrast, hospital/health care management board respondents favoured distance learning as a more "cost-effective" means of addressing the mandatory CHPE needs of health professionals, and a majority of these respondents indicated that "less expensive delivery modality" significantly influenced their decision to offer distance CHPE.

Partnering, whether with other organizations and institutions or with other internal departments, appeared to be an important characteristic of distance learning program development and delivery. The majority of respondents from schools of nursing and medicine and from hospital/health care management boards reported forming partnerships for the purpose of sharing financial, human, and/or technical resources. Across organizational categories, the most significant type of partnership was formed with other educational institutions. Schools of medicine attached a lower level of importance on forming partnerships with other internal departments in the parent institution compared to other academic organizations. Partnerships with provincial and federal government organizations and community-based agencies were not identified as significant partnership types.

The distance learning technologies reported by respondents as being used the most included (in rank order):

1. electronic mail
2. Web-based education
3. videoconferencing
4. correspondence materials
5. videotapes
6. audio teleconferencing

The main audiences of distance CHPE programs were "regional" and "provincial," and the majority of respondents reported that recent university graduates did not predominate in their distance learning programs. Schools of medicine and hospital/health care management boards reported that they addressed the needs of a predominantly rural-practitioner audience, while schools of nursing reported addressing the needs of both urban and rural practitioners. The majority of school of nursing, health professional association, and hospital/health care management board respondents indicated that participants did not require CHPE credit to maintain licensure, whereas accreditation and CHPE credit appeared to be more important for school of medicine respondents.

Providers of distance CHPE programming were more likely to report a positive perception of supportive organizational factors, technological infrastructure and access to equipment and Internet services, and level of computer experience, enthusiasm, and commitment among their distance learning target audience. The availability of technological infrastructure and specialist support appears to influence the likelihood that a provider will offer distance CHPE. According to Bates (2000), appropriate technological infrastructure is essential for distance learning. Existing learning technology resources and expertise (human, technical, and infrastructure) within an organization influence the likelihood that a CHPE provider will offer distance learning. Institutional experience was also an important characteristic of those CHPE providers involved in distance-learning delivery.

The majority of schools of nursing and medicine respondents indicated they were providing training and support to faculty and instructors who taught in their distance education programs. "Faculty development seminars/workshops," "instructional development support materials," "mentoring by experienced instructors," and "one-on-one consultation with an educational specialist" were the main types of reported activities. Support for instructors in the effective use of distance learning technologies is an essential prerequisite for successful program delivery. Comprehensive and systematic approaches to technical and professional support for faculty are also important (Bates, 2000). Ample orientation efforts must be targeted at faculty and

learners to help them become familiar with the variety of equipment they may need to use. Orientation sessions may be of particular importance for faculty, many of whom may need to alter their teaching styles in order to use the equipment most effectively (Dirksen, 1993; Fairbanks & Viens, 1995). Faculty development reportedly works best when the institution has

> a culture pervaded by the use of technology and supported by a wide range of strategies . . . a strong strategic plan in which the use of technology for teaching plays a prominent role . . . support from senior leadership for the use of technology for teaching . . . support, in a wide variety of ways, for faculty members who wish to use technology for teaching. (Bates, 2000, p. 99)

The study findings reported here are based on a national survey of Canadian providers of continuing health professional education (CHPE). The contact information for the survey respondents was compiled from a variety of sources, including the Canadian Association of Schools of Nursing (CASN), Association of Canadian Medical Colleges (ACMC), Canadian Pharmacists Association (CPhA), Canada's Research-Based Pharmaceutical Companies (Rx&D), and the Canadian Healthcare Association. The study was limited by the low response rate among certain organizational respondent categories. For example, a number of the hospital/health care management board category respondents returned uncompleted surveys because their organizations did not offer CHPE using distance learning technologies. The low response rate among this respondent category and others was likely related to this factor. A second limitation common to survey studies of this type is that the data are self-reported by the respondents being surveyed. However, since the questionnaires were anonymous and the nature of the study was not of a sensitive matter, it is unlikely that this represents an important bias.

Implications for Policy, Practice, and Research

The provision of an equitable and sustainable level of health care in rural communities has been a challenge to the Canadian health care system for some time. Rural communities have suffered from a shortage of health care practitioners for many years and have felt the chronic shortage longer and more severely than urban areas. Some rural hospitals have been at risk of closing because of a lack of health care providers, while others have experienced a drastic decrease in the level of health care they can provide (Rourke, 1998). Rural health care delivery is a demanding and challenging form of practice, regardless of the profession, and rural health care providers must often maintain a level of clinical competence beyond that of urban practitioners.

One of the distinguishing characteristics of a profession is its members' commitment to lifelong learning. The findings from this study support the notion that distance learning technologies are playing an increasingly important role in the delivery of CHPE programming to rural health care providers in Canada. Access to and uses of distance learning technologies are vital components of any effective strategy to enhance retention and recruitment of rural health care providers. However, rural practitioners require a fundamental understanding of information and communication technologies if they are to use them to pursue lifelong learning opportunities. Appropriate stakeholders need to ensure that optimal efforts are made to provide appropriate CHPE opportunities to enable health care practitioners to develop the skills they need for optimal use of technology-based learning systems.

Academic institutions are responsible for providing the majority of CHPE programming via distance learning technologies. These institutions view this programming as an important part of their mission and commitment to addressing and supporting the lifelong learning needs of health professionals, particularly those practising in rural and remote regions of Canada. Because technology-based CHPE development and delivery costs are generally higher than those associated with face-to-face CHPE delivery, external funding to support such initiatives is essential to offset those costs, which are normally not covered in institutional operating budgets. Governments have an important role to play in stimulating efforts in the development and delivery of technology-based CHPE. Bates (2000) believes that "earmarked government funding" is a good strategy for getting institutions to pay attention to developing and delivering technology-based distance education.

Partnering, whether with other organizations and institutions or with other internal departments, appears to be a significant characteristic of technology-based distance learning program development and delivery by Canadian CHPE providers. To ensure program sustainability and acceptance, CHPE providers need to partner with other organizations and communities to develop and deliver distance CHPE programs. Building and strengthening a collaborative approach between institutions avoids duplication and accesses a higher level of infrastructure and resources than would otherwise be possible. One model of partnering that appears applicable to distance CHPE is that of "consortia." In a consortium model, different institutions share common resources (such as marketing, electronic and human networks, distance education expertise, and learning centres) and agree among themselves to avoid duplication and to work together wherever possible on joint program development and delivery.

According to Bates (2001), the roles of government in managing technological change in education and training can include stimulator of "best practices"; "enabler, funder, and broker of partnerships"; "creator of technology

networks"; and "informer and protector of consumers" (p. 29). Information and communication technologies are particularly relevant to the enhancement of health care delivery in rural, remote, and northern regions of Canada. Professional isolation is a key factor that influences the recruitment and retention of health professionals in these areas, and a shortage of rural health care professionals is having a significant effect on the nature of health care services available in rural regions. Government can influence public-policy decisions in this area by:

- enabling the delivery of cost-effective CHPE to rural and remote health professionals
- increasing the capacity of organizations and institutions to utilize the power of technology to carry out their teaching, research, and service functions
- enhancing a better conception of what constitutes best practice in the field of e-learning, distributed learning, and distance education. (Bates, 2001, p. 30)

Strategies for the use of information and communication technologies in health services need to be embedded within a wider framework of government policy for health care delivery. Governments may want to consider the establishment of different centres of excellence in different institutions to ensure the development of programming for different market niches (Bates, 2000). Governments can also lever economies of scale and concentrate scarce skills in developing and running e-learning programs by encouraging or building strong national consortia.

A number of questions raised by this study could be explored in future research efforts. First, there is a growing trend in the Canadian health care system to recruit international medical graduates (IMGs) to fill positions in rural, remote, and northern communities. Many of these IMGs come from countries in which the organization, nature, and style of health care delivery is much different than in Canada. In response, a number of Canadian provinces have instituted clinical skills assessment and training programs to ensure that these individuals are competent to practise in Canada (Curran, Barrett, Lemire, & Christopher, 2003a). However, the question of how to ensure the continuation of the "professional acculturation" of these practitioners into the Canadian system has not been addressed adequately. What role could distance CHPE play in this process? Second, what are the specific characteristics of the practitioners who access and participate in distance CHPE programs? Are CHPE providers only reaching a certain audience? If so, what alternatives may be needed to reach other practitioners? Are there certain, specific barriers that CHPE providers can address to encourage and foster greater participation? Third, what type(s) of distance learning technologies

should be used to provide distance learning programming to rural health care providers? Might a mixed-learning technology approach (Curran, Kirby, Allen, & Sargeant, 2003b) or other delivery models foster greater change and transfer of learning to clinical practice behaviours? How can distance learning technologies be used to support emerging models of collaborative and interdisciplinary health care delivery among health care professionals in rural Canada? Rural communities, governments, health care organizations, and CHPE providers need additional information to ensure that new and existing rural tele-health and distance learning projects are appropriate and effective for addressing the needs of rural health care providers.

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BIOGRAPHIES

Vernon Curran is Assistant Professor, Medical Education, and Director of Academic Development, Faculty of Medicine, Memorial University of Newfoundland. He has a background in extension studies and adult education and his research includes issues in distance learning, tele-health and continuing professional education.

Vernon est professeur adjoint en enseignement médical ainsi que le directeur de perfectionnement scolaire à la Faculté de médecine à Memorial University of Newfoundland. Il a une formation en études de vulgarisation ainsi que dans la formation des adultes. Il fait ses recherches sur des questions d'apprentissage à distance, de télésanté et d'éducation professionnelle permanente.

Fran Kirby is Manager, Office of Professional Development, Faculty of Medicine, Memorial University of Newfoundland. Over the past 15 years, she has been highly involved with recruitment and retention of physicians, development of career oriented programs for youth, and continuing education programs for health professionals.

Fran Kirby est gérante du Bureau du développement professionnel pour la Faculté de médecine à Memorial University of Newfoundland. Depuis les 15 dernières années, elle s'est fortement engagée dans le recrutement et le maintien en poste de médecins, dans le développement de programmes axés sur la carrière pour adolescents ainsi qu'avec les programmes d'éducation permanente pour les professionnels de la santé.

Lisa Fleet, Research Assistant, Faculty of Medicine, Memorial University of Newfoundland, is responsible for assisting with program evaluations, need assessments, and literature reviews. Her research interests include program evaluation, survey-questionnaire design, and statistical analysis. She is also interested in distributed and distance learning and its impact on the state of rural health care in Newfoundland and Labrador.

Lisa Fleet, adjointe à la recherche dans la Faculté de médecine à Memorial University of Newfoundland, travaille aux évaluations de programmes, aux évaluations des besoins, et aux études documentaires. Ses intérêts de recherche comprennent l'évaluation de programmes, la conception de questionnaires d'enquête et l'analyse des statistiques. Elle s'intéresse aussi à l'apprentissage distribué et à distance et leur impacte sur l'état des soins de santé en milieux ruraux situés à Terre-Neuve et au Labrador.