Towards a Strategy for
Distributed Learning
in Support of Health

CANARIE INC.

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Preface
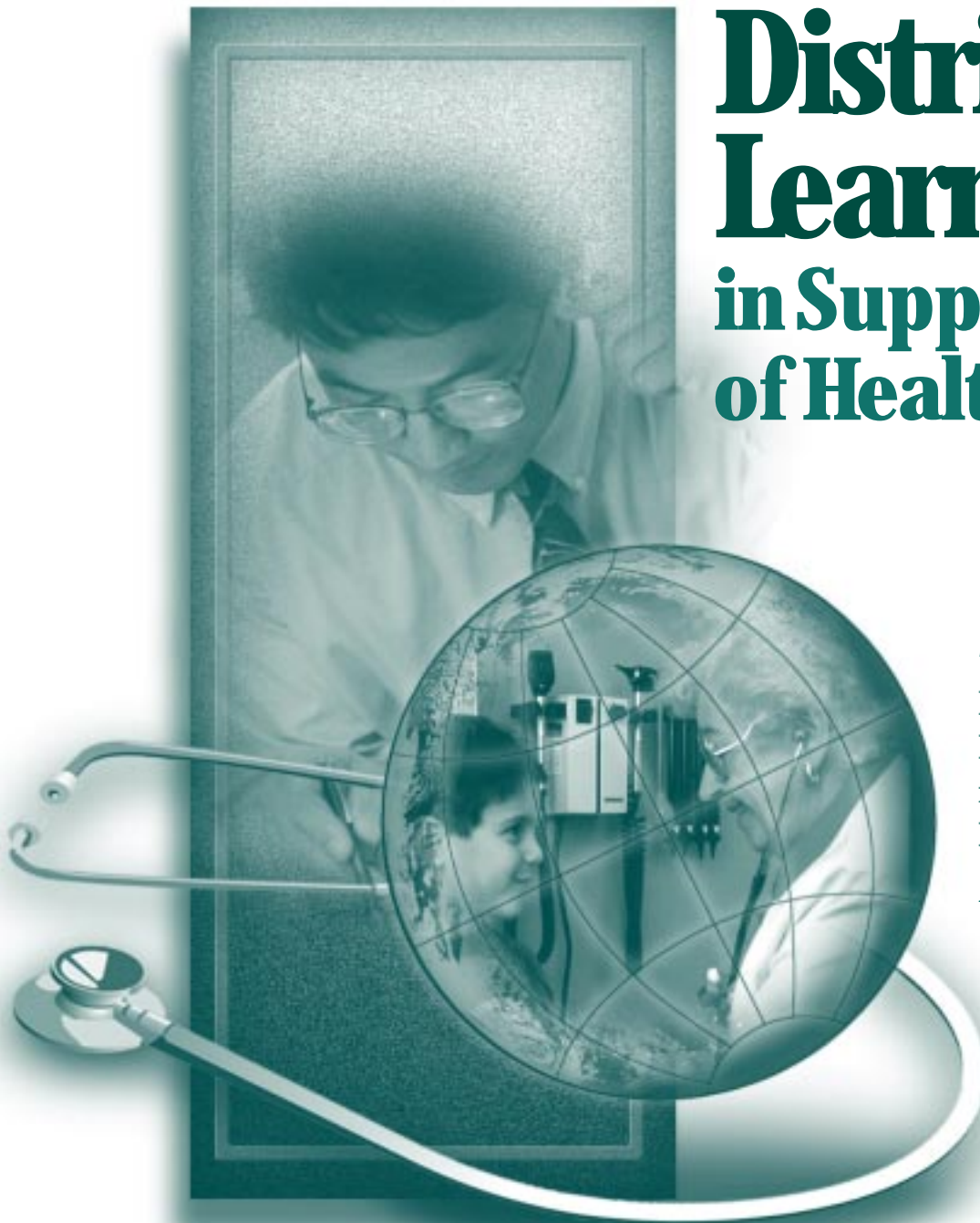
This is the fourth in a series of reports issued by CANARIE Inc. regarding aspects of telehealth. It is based on a workshop held in Vancouver, British Columbia, in November 1997 entitled *Bridging the Pacific: Education and Health for All through Distance Learning.* The workshop brought together stakeholders from the health and education communities around the Pacific Rim, including representatives of governments and the private sector. The focus of the workshop was on identifying opportunities and challenges for using distributed learning techniques and technologies in support of education and health for all members of the global community. Held in concert with the annual Asia Pacific Enonomic Cooperation Conference, this workshop looked beyond Canada's borders and explored some of the global issues important not just to telehealth, but to the broader use of distributed learning in support of both educational development and health improvement.

In September 1996, the first of the CANARIE reports, *Towards a Canadian Health IWAY: Vision, Opportunities and Future Steps*, set out a vision of a Canadian Health Information Network, which it called the "Canadian Health IWAY," and recommended several follow-up actions. The recommendations of that report were echoed in reports of other groups considering similar technology and application issues. Collectively these reports helped to create a broader awareness of the strategic importance of telehealth in Canada.

The second report, released in July 1997, was entitled *Telehealth in Canada: Clinical Networking, Eliminating Distances*, and was based on a CANARIE workshop held in Quebec City in March of that year. The focus of that workshop was on new application areas for telehealth, including the latest developments by govern-

ments and the private sector, and the challenges on the road ahead.

The third report, released in December 1997, was entitled *Ensuring Privacy and Confidentiality on Canada's Health IWAY*, and focussed on identifying policy, legal, regulatory and technological issues, solutions and clinical protocols relating to privacy, confidentiality and security in telehealth. It was based on contributions from many participants attending a workshop held in October 1997 in St. John's, Newfoundland.

As with its predecessors, the current report summarizes the issues and information presented and discussed by participants attending a workshop, in this case the *Bridging the Pacific* workshop in Vancouver. In a few places in the report, individual attribution and references have been provided, although all of the content of the paper stems from comments made or references given by speakers and others at the workshop. Background documentation and a broader description of CANARIE's telehealth activities and initiatives are available on CANARIE's web site at *http://www.canarie.ca*.

The Canadian Health Iway will be a virtual information centre that is created and used by communities and individuals across Canada. It will be open and accessible, yet assure sufficient confidentiality and privacy to assist decision-making by health professionals and patients; support research and training; facilitate management of the health system; and respond to the health information needs of the public. The network will be an agent of change for the health system and contribute to improving the health of Canadians. It will also foster the development of globally competitive Canadian technologies and services.

Introduction

A diverse group of government and private sector representatives from around the Pacific Rim came together in Vancouver during the 1997 Asia Pacific Economic Cooperation (APEC) meeting in order to discuss how distance learning can help address both education and health needs across the globe. There were three general themes that provided the initial focus for the workshop: collaboration, social change and technological development.

Participants also identified four objectives for the workshop:

> to build partnerships;

> to discover opportunities;

> to identify next steps; and

> to produce a summary report.

The two days of panel presentations and workshop sessions led to a number of outcomes. Among the most important were the identification of important learning and sharing opportunities, the exposure of some significant challenges on the road ahead for both telelearning and telehealth, and the highlighting of a number of possible next steps. In sum, the workshop and this report constitute a case study of the role and importance of distributed learning, specifically in relation to addressing health needs and supporting health improvements.

Identifying Opportunities

The strong consensus of workshop participants was that, since much of the technology required for telelearning and telehealth is already available, increased attention should be paid to the human issues encountered in using the technology and extending it in positive and constructive ways. Fortunately, there is a growing interest within the respective communities in using distributed learning techniques to support health and education, and this interest constitutes a significant opportunity. Moreover, because of the global nature of this interest and the underlying needs related to health and education, this opportunity is itself global, and presents an opportunity for broad-based collaboration. Finally, considerable national and international expertise related to these opportunities already exists, and there is a real opportunity to promote increased collaboration by creating appropriate venues, both conventional and technology-mediated, for mutual learning aimed at sustaining and expanding this expertise.

Sharing Challenges

Workshop participants also agreed that, as is usually the case, alongside these opportunities come some special challenges. In particular, the attempt to realize the benefits of distributed learning, while at the same time valuing cultural distinctness and responding to the unique needs of those distinct cultures, presents an ever-present challenge. One difficult but necessary activity relating to this is the need to confront traditions that have built up within the health and education professions in different societies. A special challenge in this respect is the need to reach agreement within those professions on the creation of new incentives relating to participation in the development and use of distributed learning. Developing effective

partnerships with the private sector and government related to the support of distributed learning also poses a special challenge in many countries.

Agreeing on Definitions

Participants agreed that there is a need for more precise definitions of some of the key concepts addressed in the workshops themes. The following were generally accepted as a good starting point:

Telehealth is the use of advanced telecommunications and information technologies to exchange health information and provide health care services across geographic, temporal, social and cultural barriers (based on Reid 1996).
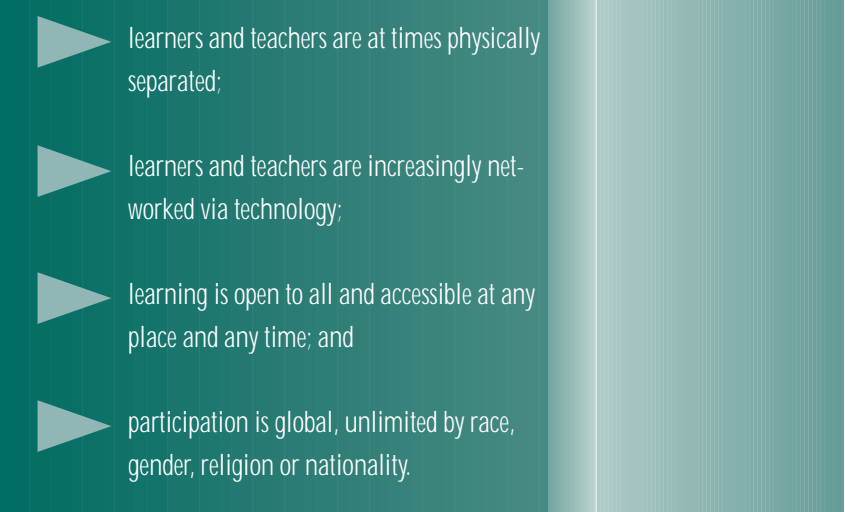
Telelearning, by extrapolation, is the use of these same technologies to enhance learning across similar barriers. It is often the case that, where a technological link may have been constructed initially for telehealth, its use is often extended to include wider telelearning activities as well.

Distance education (or *distance learning*) is the traditional label for telelearning that also implies a separation between learner and teacher. As the definition of telelearning suggests, such a separation, while perhaps more normally geographic or temporal, can be intensified by social and cultural differences.

Distributed learning is becoming the preferred label for many telelearning or distance education activities, and can be thought of as any educational experience not being conducted solely through face to face or classroom encounters.

There was general agreement among workshop participants that, while different labels and definitions do not constitute competing programs or approaches, the term "distributed learning" has come to signify a broad and helpful framework for what is becoming the fastest growing form of education in the world. In its most general form, the attributes for this form of education include the following:

▶ learners and teachers are at times physically separated;

▶ learners and teachers are increasingly networked via technology;

▶ learning is open to all and accessible at any place and any time; and

▶ participation is global, unlimited by race, gender, religion or nationality.

Given the general nature of the learning model being proposed under this concept, it can also be seen as stressing several features absent in other approaches. Of special importance in this regard are the interaction of distance and face-to-face learning opportunities, the possible involvement of multiple sectors (e.g. health *and* education) and the fact that different learning needs require different learning solutions.

Collaboration Through Change

During the discussions, workshop participants highlighted several dynamic forces and pressures for change related to the use of distributed learning in support of health, including social issues, economic constraints and specific information needs. These provide an important context for the emerging themes and priorities for action arising from the more specific deliberations of the workshop.

Social Issues

There is already an extensive international community working on the broader social issues raised by participants at the workshop. This community is aware of many of the special challenges encountered in distributed learning. Closing the education gaps within and among nations, enabling access to health and education for even the most remote populations and improving understanding of different cultures that possess both shared and distinct needs are only the most obvious of these.

The wealth of new information and communications technologies presents this international community with a real opportunity. However, it also requires that these technologies be shared widely and equitably.

Unfortunately, there is evidence that the gaps between rich and poor nations, and between rich and poor people within countries, in terms of wealth and in terms of access to and use of technology, are widening. It will be important for national and international efforts to address these widening gaps. At the same time, it will be important for these efforts to help confront other major social challenges, such as those relating to the promotion of better health and education, cleaner environments and greater democracy and freedom.

In 1995, Nelson Mandela, president of South Africa, highlighted the serious consequences of this trend for developing countries:

"The present reality is that the technology gap between developed and developing nations is actually widening.... Most of the developing world has no experience of what readily accessible communications can do for their society and their economy."

Economic Challenges

Information that can be accessed and used easily and appropriately by a wide range of users is expensive to produce. If this is the information of greatest value in the development and promotion of distributed learning, there will always be competing demands for the resources needed to produce it. Of particular concern in this regard is the information needed to undertake large-scale retraining.

One conference presenter estimated that 80 percent of the world's workforce of the year 2005 is already in place. If this existing workforce is to be equipped with the skills that will be needed to make effective contributions to the economy of that era, given the rapid changes taking place in that respect, the need for retraining is massive indeed. As well,

the increasingly global orientation of trade requires a corresponding effort at global retraining. For all these reasons, education and retraining are important economic challenges. Properly funded, distributed learning can make a significant contribution to meeting many of these needs.

Information and Learning Needs

Knowledge continues to develop rapidly and is becoming increasingly specialized. Moreover, the information and learning needs of individuals are often quite specific and usually evolve with changing circumstances of the individual. For practical reasons, therefore, there must be multiple "pathways" for individuals to access information and acquire knowledge: in this instance, one size will clearly *not* fit all! Since accessing information and acquiring knowledge are such fundamentally *human* undertakings, there is also a need to ensure the acceptability and practicality of the pathways to information and knowledge from diverse cultural positions.

At the level of the individual, learning involves a number of multifaceted activities taking place in a social context. The complexity of these activities can also be intensified in times of rapid and/or significant social change. Workshop participants suggested that, in order to confront the challenges of distributed learning, the complexity of the learning process must be acknowledged and addressed through multilayered training and multileveled learning processes.

Organizational change was also recognized by workshop participants as, in some situations, being a part of, if not a prerequisite to, the success of distributed learning efforts. However, in the health and education sectors, organizational change remains problematic. Speakers noted, for example, that the broader working environment for health

professionals will almost certainly continue to be one of innovation and change on all fronts. While it would be desirable to incorporate wider use of distributed learning as these environmental changes occur, to do so will require the development of a set of adaptable yet sustainable learning tools, as well as a paradigm shift.

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Emerging Themes for Health

The workshop was attended by participants from Malaysia, Australia, the United States and Canada. They came in order to learn about current initiatives in distance learning in health taking place within or between different countries; to share understanding and lessons arising from their activities; and to explore interests in forming linkages, collaborations and partnerships in future distributed health education activities.

The workshop discussions focussing specifically on health-related uses of distributed learning techniques took place in two concentrated sessions. During these discussions, three main themes emerged. First, various "human factors" were identified as being of fundamental concern, including many sensitive, cross-cultural issues touching on language, customs, socio-economic conditions, laws and traditions. Second, several "realignment and integration" problems were identified relating to the role of institutions in assisting or retarding change. Among the focusses in this part of the discussion were the transformation of the health education and care systems, the role of institutions in creating incentives for individuals, the creation and sustaining of support mechanisms for individuals and the need for individuals to act as innovators and motivators of others. Finally, the

broader issue of "globalization" was discussed, in particular the desire for promoting the joint development and sharing of learning frameworks and curriculum templates. The key challenges in this regard seem to center around connecting and sharing across diverse socio-cultural environments while remaining sensitive to cross cultural differences and other societal distinctions (e.g. varying legal responsibilities in relation to issues such as privacy of information and ownership of intellectual property). Each of these three themes will be explored in greater detail below.

The more general aim of the workshop discussion, however, was to explore how to achieve a flexible, culturally sensitive balance across the three themes. There was broad support for using distributed learning as an integrating technology in support of this goal. There was also support for the creation of a network for extending and sharing knowledge concerning the broader determinants of health problems around the world, and concerning related, multidisciplinary issues arising in sociology, education, health and health care delivery. The discussion identified a critical challenge relating to how learning within and across some of these related disciplines or sectors could develop a better understanding of where these issues become barriers rather than enablers. For example, identifying where cross-cultural issues are of special importance could be included in course content developed for a global audience, and could underline the importance of value systems as they contribute to the determinants of health in any given society or country.

Human Factor

There was an overwhelming consensus among workshop participants that the most serious barriers to the creation of distributed learning networks are not technological.

Rather, both the most critical challenges and the most likely future solutions are probably to be found through addressing the "human factors." In this regard, it was noted that both developed and developing countries face similar challenges, although the precise manifestation of these "human factors" may be dependent on the social, cultural and organizational context. Moreover, this point was not intended to deny the obvious fact that ensuring that adequate infrastructure exists and is accessible to all is still of great concern in most developing countries.

It was noted that in both developing and developed countries, increased effort is required to ensure that people interact positively with information technology and that training is provided in appropriate ways for different groups. In general, however, the scope of the "human factor" in the diffusion of technology is so broad that it is difficult to see it in its entirety.

One dimension clearly has to do with resistance to change on the part of those directly affected by technological developments. While such resistance is probably as old as technology itself, in the health context, both providers and recipients of care appear to need help understanding the benefits offered by new technology. Although such awareness-raising efforts should stress the goal of meeting health needs more effectively, they should also acknowledge that, to those on the receiving end, changes to current practices and clashes with current preferences are also part of reality. Health professionals and technology specialists need to work alongside one another in this effort, and both must work more effectively with client groups. In general, the message should be that effective use of the technology will support the drive to make health education and health care more client driven, hindered only by the limits of

knowledge and of the technology available to transmit that knowledge.

Workshop participants noted that, in terms of developing new information technologies, one way to have the technology used more effectively within the health sector and elsewhere would involve having it developed in such a way that it "works the way the human mind operates." Although any general answer to this challenge would have to be regarded as the "holy grail" of information technology, guidance could well be found in such fields as communication, cultural studies, natural languages, learning technologies, pedagogy, sociology, education and health. In general, there is a strongly felt need to humanize the interaction with technology, emphasizing the human element before, during and after the technology interaction. Likewise, there is a need for user friendly and truly accessible systems that support and enhance the performance of individuals. Such systems, it was felt, will help users to get on-line and to stay on-line effectively.

Language is as fundamental a human factor as can be found, and the so far unmet need for access to the technology in the different languages of the world was seen as a critical barrier to the diffusion of the technology. One solution might be to use software, perhaps based on Internet standards, that does "just-in-time" translation. Having students and teachers work together to better understand the intercultural dimensions of certain technology applications will also support communication across cultural boundaries. In the learning context, increasing the availability of information designed for clients of different genders, ages, or cultures would also help support targeted learning for various and distinct groups of people.

Realignment and Integration

The issues surrounding the theme of "realignment and integration" in the development and use of technology for health-related learning are numerous and complex, and the workshop discussions on this theme were broad and far-reaching. Not surprisingly, many participants commented on the legislative, professional and organizational barriers currently preventing effective and broader use of the available technology, and on the changes in institutional and professional incentives that could play a part in motivating the behavioral changes that would lead to widespread adoption of the technology.

As always, definitions were seen as being key, especially as the way that words are used can reflect and reinforce entrenched positions. There was shared agreement that, in this context, the concepts of "health" and "distributed learning related to health" require a broad definition, encompassing the wider determinants of health and illness. Specifically, participants urged that health be seen as more than medicine, and that distributed learning for health be seen as more than traditional telemedicine. It was acknowledged that adopting the broader terminology might make some stakeholders uncomfortable in the short term, but that it was important to adopt the broader definitions to make it possible to evolve towards a flexible and dynamic framework in the longer term. To do otherwise was seen by the participants as reflecting a "silo" approach, and as symptomatic of the need to break barriers down through the use of technology. In brief, we should avoid simply "reconstructing the current silos on the web."

Extensive discussion also surrounded the matter of legislation, specifically legislation dealing with liability, licensing and privacy. In general, legislation regarding telehealth liability was seen as a problem in Canada and most other places internationally, where there are varying legal issues that have yet to be resolved. Although liability when telehealth technologies are used is one issue, it was also noted that one person at a recent Health Care Information Management Systems Society Conference in Texas, suggested that if doctors were not using telemedicine technologies to serve patients then they could be sued. Until this issue is resolved, reaping the benefits of distributed leaning networks to help in health-related applications will likely be delayed.

On the other hand, one presenter at the workshop expressed the view that liability legislation may be premature, since it is still "early days" for the technology, and practice and standards relating to practice usually take several years to develop. Some participants suggested that it may be preferable at this stage to support the development of acceptable and appropriate standards for telehealth in order to smooth the way for legislation and eventually for the safe and effective use of telehealth applications.

There are also some hopeful signs on the legislative front. One participant reported that Malaysia passed a telemedicine act that enables international doctors to practice telemedicine in that country. Standards of ethical practice have also been incorporated in a new law relating to confidentiality. In turn, this is expected to affect institutional education programs in this area.

Privacy and confidentiality issues and legislation regarding privacy were also discussed in this context, although they are such large topics that they could only be touched on. One question was raised concerning who the custodian of patient information will wind up being as health information networks are implemented and consolidated records are developed that combine information from many sources.

Another question was raised concerning the risk of increased scrutiny of the behaviour of medical professionals through such networks, which may not be desired and which, if tolerated, could create resistance among health care provider groups. In general, privacy and confidentiality were seen as critical issues, and the consensus was that broad public participation in the debate concerning appropriate use of and access to health information is essential.

Participants in the discussion also identified some hopeful signs that the new technologies and applications are being adopted. For example, a recent study of 100 telemedicine networks found that, although they were initially established to support health applications, they quickly became vehicles for broader distance education applications as well. This was seen as an example of the ease with which the technology can be expanded to support multiple, mutually compatible applications.

A word of caution concerning the pace of change was also noted. As Alvin Tofler warns in *The Third Wave*, technology is advancing at a much faster pace than government policies and agendas can adapt. Although it may not be possible to change the pace of technological advances, we should be aware that, to the extent that governments must be a partner in some of the applications of concern, the issue of incompatible time scales must be addressed somehow.

Not only governments face unique challenges in adapting to rapid technological change. Large universities also face major tensions. For example, it has become traditional that faculty at large institutions concentrate their efforts on research. "Publish or perish" is more than just a saying. On the other hand, many universities have recently been forced to accept increased student enrolments without any increase in faculty numbers. In many cases, university administrators are also aware that the learning needs of the larger student cohort are not well-aligned with the primary career interests of faculty.

This is a large and contentious issue, to which there is no single approach or solution. Technology and distributed learning applications might be of some assistance, however. In the view of workshop participants, it was important for pilot projects in this area to focus in specific areas in which technology has already been shown to work effectively. It was also important for the use of distributed learning technology to be augmented with face-to-face contact and other modes of learning. Finally, along with many university administrators and many university faculty, workshop participants felt that it was important to realign institutional and professional incentive structures to give greater emphasis to meeting student needs, including through the development of more user friendly and more easily accessible learning opportunities.

At a more fundamental level, workshop participants urged once again that the use of technology be responsive to the health and learning needs of the clients. They acknowledged that any discussion of those needs inherently raises a broad range of related needs, including infrastructure needs, public health surveillance needs, needs relating to economic growth and needs relating to ever changing learning environments among others. On the infrastructure issue alone, for example, it was pointed out that in many parts of the world, basic technology such as phone, fax or television, is still lacking, while in others these basic technologies still dominate. A balance is clearly required between efforts to develop ever more advanced applications that require infrastructure that may not be broadly available, and efforts to develop applications that need only basic infrastructure.

Of course, across Canada and around the world there have been numerous pilot projects, trials and case studies of telehealth and distributed learning applications involving both basic and advanced technologies. In many of these the development of cost/benefit analyses was an important consideration. Nonetheless, there appear to be few studies in the peer-reviewed literature demonstrating conclusively that there are cost savings in these areas, and so addressing this issue remains a challenge. Quite clearly, and notwithstanding the views of the National Forum on Health and other similar committees regarding the value of telehealth applications, the resources required to support the broad-based introduction of these technologies and applications will not be made available until a compelling business case is presented.

Related to the need for cost/benefit analyses is the need to establish standards and best practices in these areas. There also needs to be greater collaboration between health professionals and the communications and information industries to establish a common understanding of the non-technical issues in these application areas, as well as of the technical capabilities and limits of what technology can offer. Industry recognizes that technology needs to be invisible to make learning more efficient and is ready to work with content providers on addressing this goal. The focus should be on a partnership between the two sectors and on learning together.

In sum, participants agreed that, understandably, those with the most at stake when new technologies turn their world upside down are often the most cautious about change. In the context of telehealth applications, health professionals, in particular physicians, would seem to be the ones on the hot seat. Physicians, however, are swayed by their profession's assessment of what is reasonable in terms of treatment and procedure. If they are to become comfortable with telehealth and distributed learning, therefore, the profession's assessment of what is reasonable must be expanded to encompass these new technologies and new applications. On the plus side, there is a growing awareness that the acquisition of skills and knowledge in the health field and the broader service of clients' health needs can both be facilitated through telehealth and distributed learning technologies. However, the full-scale implementation of these applications would seem to require, in addition to the suggestions made above, a realignment of professional incentives for those most directly involved, and that is a longer-term undertaking.

Globalization

Many of the issues related to telehealth and distributed learning in health are global issues, and there is a large community of researchers and other stakeholders, including many participants at the workshop, eager to share information and to work cooperatively to develop and promote a broad international agenda in this area. As a result, the discussion surrounding this theme was especially vigorous, and many ideas emerged. These clustered under four main headings: needs, barriers, enablers and Canada's role.

Needs

▷ There is a need to learn from each other and share solutions between provinces/countries in all areas, including legislation and licensing.

▷ A combination of international, national and more localized networks is needed to help remove barriers to health information highway development, and to allow growth and developments to be shared .

▷ In particular, an international network is needed to share resources and promote the development of new applications. The network must be culturally sensitive, promote sharing across diverse capacities and needs, and allow targeted access, and must not simply create an information overload. Potential conduits include a web site, listservers, electronic network representation for Canadian health systems, keyword searchable databases and point casts, etc.

▷ A core curriculum needs to be defined (perhaps an adaptable template) that can be built upon and focussed to local cultural needs and circumstances.

▷ The question of distribution of costs and benefits needs to be addressed, including the matter of who pays and wins the rewards if there are multiple users from different countries.

▷ The tension between the desire to partner and share information and the competitiveness of institutions or nations must be addressed.

▷ With globalization, the need for quality assurance must be recognized, since bad ideas travel just as well and quickly as good ideas.

Barriers

▷ The basic barriers include the usual ones of inadequate infrastructure, staffing and funding.

▷ Specific barriers include the development, operation and sustainability of the proposed networks.

▷ Of great concern is the challenge of disseminating and diffusing applications and information across cultural boundaries, indeed the creation of cultural change as a result of these activities.

▷ The lack of supporting evidence on the effectiveness of distributed learning is a major barrier, including the absence of good evaluation frameworks to conclusively resolve this issue.

▷ The lack of standards for interoperability (technical, professional, accreditation), the unaddressed policy issues (privacy, security, legal liability), and the lack of clinical will were also seen as critical barriers.

Enablers

▷ The desire to share information, problems, solutions and curricula in the health sciences area is seen as the basic enabler. The building and sharing of a database of opportunities and needs was seen as a place to start to build on this willingness to collaborate.

▷ The fact that telecommunications companies are interested in health information and services delivery, including both professional services and consumer health delivery, was seen as a major enabler. An increasing number of programs and applications will be delivered directly to the consumer, and over time this may influence the nature of interactions between clients and health practitioners.

▷ In time, recognition of the investment potential in this field could function as an enabler, as could the development of the technology infrastructure and the emergence of high-profile champions.

Canada's Role

▷ Funding for international activities in Canada has become scarce, which may present an opportunity for CANARIE to provide leadership through incentives for partnerships in the area of global connection for health-related learning.

▷ The greatest contribution Canada can make to developing APEC countries is in the area of training.

Canadians have become recognized trainers of the trainers.

▷ Canadians also have a role in promoting health equity. Although activity on this front might not lend itself to straightforward cost-benefit analysis, it is an important global objective and requires leadership.

Priorities for Action in Support of Health

Arising from the discussion of the three themes of human factors, realignment and integration, and, finally, globalization, there emerged a clear definition of the priority areas in which opportunities could be maximized and barriers could be removed. Targeted areas in this respect included the following:

- research and development (researching, evaluating and establishing needs and benefits);

- collaboration (creating a sharing community that will develop partnerships, linkages, standards and policies);

- promotion and facilitation of distributed learning (encouraging leadership, sharing materials and expertise);

- Efforts to obtain funding and resources (expanding funding capacities and opportunities); and

- realizing opportunities through sustained networking (working together whenever, where ever, however possible).

Within this context, three specific focusses for follow-up action were defined: workshops, communication and networking. Each will be discussed briefly.

Developing and Conducting Learning Workshops

There is a need to organize future workshops focussing on the human dimension of using technology in support of health-related learning. Workshop participants suggested that, as an organization dedicated to supporting learning related to effective use of technology, CANARIE should continue to provide critical leadership in this area. Some of CANARIE's continuing effort should be directed at creating venues for stakeholders to share problems and to identify workable solutions supporting improved and expanded use of technology for health education and health gain.

Promoting Vehicles for Distributed Communication

Distributed learning can effectively support and extend opportunities for health-related learning. It would be desirable to see existing networks, especially the advanced broadband networks, carry an increased amount of distributed learning traffic. Other venues and vehicles for supporting communications needs among groups focussed on technology-assisted distributed learning should be developed. Substantially enhanced capacities to share costs and benefits, themselves a means to the end, require wider communications activities.

Building and Sustaining Networks

Networks will provide the conduits for many facets of learning. These conduits are both technological and human. The technology provides the infrastructure; the humans provide the knowledge, the commitment and the concerted action required for any real gain in health education and health improvement. The concept of "networks for networking" emerged as a vivid and apt descriptor of using network technology to enable the development of the human networks that ultimately are required to drive the acceptance of distributed learning in support of health for all.

Conclusions and Next Steps

As this report has attempted to capture, the discussion at the workshop was far-reaching and helped participants develop a better understanding of the myriad of challenges that must be addressed as we learn to use the new technologies to help meet human needs in health and learning. Participants were able to agree that three major themes (human factors, realignment and integration, and globalization) encompass the range of the most significant issues critical to the development and support of distributed learning opportunities for health. Future challenges include determining where the group of stakeholders that participated in the workshop can best effect change, recognizing that new roles must be filled and other key stakeholders must join the discussion if any real progress is to be made.

The workshop ended with a shared appreciation that the *Bridging the Pacific* group must determine where it can provide leadership and enable change and when that role must be played by others. Several next steps were proposed as to how this challenge can be addressed and how the broader development of distributed learning in Canada and around the Pacific Rim can be pursued:

- prepare and disseminate a conference report;

- distribute knowledge gains widely;

- identify champions and stakeholders in each province in Canada and in interested Pacific Rim partners;

- direct some efforts towards specific and targeted areas of distributed learning in and for health; and

- build and sustain a broad and inclusive network for developing and sharing the benefits of distributed learning.

At the close of the two-day workshop there was a firm commitment to sustain the *Bridging the Pacific* list-server, to hold a future invitational workshop on the human dimensions of distributed learning for health, and to examine the possibility of holding a series of regular provincial or regional workshops across Canada and the Pacific Rim.

Clearly, a major underlying and recurring observation that will be carried forward from this workshop is that none of the barriers to global sharing of opportunities related to distributed learning for health are substantially technological. It is clear that we have the technology. The question is, do we have the humanity?

Conference Speakers

Keynote Speakers

David Arnatt, Distance Learning British Columbia

John Gilbert, Health Sciences, University of
British Columbia

Tony Bates, Distance Education and National
Developments Technology, University of
British Columbia

Brian Gillespie, President,
British Columbia Institute of Technology

Robert Smith, Stentor Innovation Centre

Educational Panel

Dora Esthela Rodriguez Flores, Monterrey Technical
Institute, Mexico

Jeanne Kurz, British Columbia Institute
of Technology — International

Chuck Hamilton, IBM Pacific Development Centre

Peter Donkers, Open School

George Eisler, British Columbia Institute of Technology

Louis Giguere, Open University

Health Panel

Andrew K. Bjerring, CANARIE Inc.

Michael Seear, University of British Columbia

Carl Robbins, Memorial University of Newfoundland

Sharifa Shahabudin, The National University, Malaysia

Technology Presenters

Sal Visca, Distance Learning, IBM Pacific Development Centre

Adrian Kershaw, Community and Distributed Learning
Services, College of the Cariboo

Rick Morgan, BCTel Discovery Learning

Glen Hocking and Ron Bowles, Paramedic Academy,
Justice Institute of British Columbia

Tom Calvert, TeleLearning Research Network, Simon
Fraser University

Bill Neale, New Products Development, BC Tel Advanced
Communications

Barry Wiggs, St. Paul's Hospital, University of British
Columbia

Peter Cahoon, Media and Graphics Interdisciplinary
Centre, University of British Columbia

Susan Hutchison, Family Physician, Kentville, Nova Scotia

Allan Hannam, Craniofacial Biology, University of British
Columbia

David Precious, Oral and Maxiofacial Sciences, Dalhousie
University

Tony Williams, Paramedic Academy, Justice Institute of
British Columbia

Workshop Participants

Ron Baker, Stentor Innovation Centre

Linda Bartlett, Health Canada

Andrew K. Bjerring, CANARIE Inc.

Carmelita Boivin-Cole, Atlantic Canada Opportunities Agency

Tom Calvert, Simon Fraser University

Brenda Conrad, The Center for Health Studies,
     Mount Royal College

Pat Collins, MDS Metro Labs

Donald Hillman, Centre for International Health
     and Development, University of Ottawa

Elizabeth Hillman, Centre for International Health
     and Development, University of Ottawa

Penny Jennett, Health Telematics Unit, Faculty
     of Medicine, University of Calgary

June MacDonald, Design Team for Distance Learning,
     Community College-Saint John

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