

Articles

AN EXPLORATION OF TECHNOLOGY, HEALTH CARE, AND PREVENTATIVE EDUCATION IN COASTAL NEWFOUNDLAND

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Abstract

In 2002, video conferencing was introduced into five communities on the southwest coast of Newfoundland to augment health care and preventative education. Through focus groups and individual interviews with female health practitioners and community members, this study explored their concerns and visions for the future around this technology. Findings show that technical problems, issues of confidentiality, fear of further health care erosion, and lack of training are major hindrances. There is also a definite clash between technical training and distance on the one hand, and a hands-on, caring pedagogy on the other. However, video conferencing is slowly coming to be used for some diagnostic purposes, and health education and research are augmented by Internet access. If technical problems are resolved and the needs and experiences of nurse practitioners are used to guide the application of information and communication technology (ICT), then ICT will become a tool, servant, and additional support for health care and preventative education.

Résumé

En 2002, la vidéo-conférence a été introduite dans cinq communautés le long de la côte sud-ouest de Terre-Neuve afin d'améliorer les systèmes de santé et d'édu

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utilisée pour faire des diagnostics, bien que la formation et les connaissances au sujet de la santé ont augmenté dû à l'accès répandu à internet. À moins que les problèmes et que les conflits sur la qualité de la formation soient adressés, cette forme de 'télé-santé' restera inefficace.

Introduction

Over the past two decades, coastal communities of Newfoundland and Labrador have seen a progressive deterioration in health care and an escalation in health-related problems as a result of unemployment and poverty, environmental degradation, poor diets, and inactivity (Dwyer, 2004; Omer, 2007). Many small communities—or outports as they are known in Newfoundland and Labrador—on the southwest coast currently have access solely to small on-site clinics visited bi-weekly by doctors and/or nurse practitioners. For major health services, people must travel to larger urban areas, which can be both costly and time-consuming (Battcock, 2005; Dwyer, 2004). In response, the provincial government has implemented an information and communication technology (ICT) strategy to enhance and expand health care. One primary objective of initiating ICT health care is to ensure more equitable services in remote rural communities. Key to this strategy is training health practitioners to use the equipment and to provide them with opportunities to determine what is applicable for their region and patients in terms of education and care (Battcock, 2005; Dwyer, 2004; Health Canada, 2000).

The context of our research was five small outport communities on the southwest coast of Newfoundland. In 2002, the non-profit Burgeo Broadcasting System (BBS) obtained funding from Health Canada to introduce video conferencing into these outports. Apart from this initiative, BBS also installed broadband Internet access into each community. The aim of our study was to explore the problems and potentials of ICT related to health care and preventative education.¹ Using a critical theory framework, we engaged in unstructured individual interviews and focus groups with nurse practitioners, health care providers, and female residents about their experiences, concerns, and ideas for the future.

This article begins with a discussion of technical rationality theory and its link to health care and education. We then outline our research methodology and procedures and present our findings. The paper concludes with a discussion of implications of ICT for health care and preventative education on the southwest coast of Newfoundland. If technical problems are resolved, training is augmented, the needs and experiences of nurse practitioners are used to guide the application of ICT, and the concerns of citizens are addressed, then ICT will become an important tool and additional support for health care and preventative education.

Theoretical Framework: Technical Rationality and Health Education

The modern age is one of technical rationality; a way of thinking and living that emphasizes technological progress (Feenberg & Hannay, 1995, Winner, 1996). In fact,

¹ This health aspect of the research was part of a larger study of ICT in terms of health care, community development, and schooling in these five communities. The study was made possible by the financial support of the Social Sciences and Humanities Research Council (SSHRC).

technology has often come to be seen as the physical embodiment of contemporary scientific thought and the answer to many of the questions of contemporary society (Vakkari, 2004). As a 'neutral' tool, it promises instrumental improvements, benefits, and freedoms to the lives of people, over reproduction or information, global access to information (Hawthornthwaite, 1991; Moll, 2001, Nardi, 2000; Turow, 1999). In essence, technology is nothing less than a fundamental human right and a "social and cultural right" (2003, p. 43).

Critical theorists, educators, and feminists, however, caution against a fully optimistic view of technology without closer examination. Feenberg and Hanney (1995) argue, it is not so much technology that is neutral nor deterministic—that needs to be challenged, but rather the mediation of technology in terms of power, control, and democratic participation—this is the perspective we took in our study—technical rationality and its tendency to frame social, economic, and cultural issues in technical terms, to look for solutions to those problems solely within that domain (Feenberg, 2003; Moll, 2001) rather than technology being a mere servant function. It becomes the environment within which a way of life is elaborated (Hanney, 1999, p. 1). As Feenberg (1999) found, ICT is often introduced to everyone is simply supposed to figure out how to use it. He suggests an important question: "How is the thing going to be used before resources are committed to a specific plan or design?" (p. 1). Building on the cautions of Feenberg, everything in technological terms often leads to the how-to of the equipment as the end result of education rather than the what of the technology and potential of the technology. For feminists, important issues related to technology are often neglected (Coupal, 2002; Feenberg, 1999). For example, Huws (2000) challenges dominant understandings of the differences between the needs, values, concerns, and learning patterns of men and women. How has technology become in contemporary society? More questions, such as the motives behind the implementation of technology or the on-ground impacts, remain unanswered (Feenberg & Hanney, 1999, p. 196).

Across Canada, health care and education are becoming more and more technologized (Picot, 1998). On one hand, this is seen as a positive change. For example, de Koning and Martin (1996) suggest that, when it comes to health care, there is often an aura or mystique around medicine and doctors that has a tendency "to make a human being dependent as opposed to an active agent in pursuit of her/his own health" (p. 24). They believe that technology has the potential to level this playing field by giving people greater access to and information about health issues. Picot (1998) refers to this as the health information highway, and he notes the amount of information available

situation" (p. 275). Oenema, Brug, and Lechner (2001) have found that computerized nutrition education using tailored messaging was extremely effective in terms of inducing dietary behavioural change. The technology was rated more personally relevant and had "more subjective impact on opinions and intentions to change than the general nutrition information" such as pamphlets or even interactions with professionals (p. 647). They also noted that this type of ICT health education could reach more people and was more cost-effective than face-to-face practices. This has real potential to bring about what Chovanec and Foss (2006) call a broader vision of health literacy and learning. But scholars also warn that there are reasons to be concerned, as many health care reforms have negative impacts (Armstrong & Armstrong, 1996; Botting, 2002; Gustafson, 2000). For example, concerns have been raised, in particular, around the technologized medicalization of women's lives, which is often disempowering for patients and professionals (Hawthorne & Klein, 1991). In fact, women make up a large portion of health care providers and, therefore, any restructuring is "particularly relevant to women's experiences as paid workers" (Botting, 2002, p. 29). Many recent reforms have put female medical staff out of work (Armstrong & Armstrong, 1996). Those who remain in the system see "more and more pressure being put on *family members* [italics added] who have to look after their relatives" as workloads increase and more time must be spent away from home (Botting, 2002, p. 31). These family members are predominantly women, as they provide the bulk of care to their own families (Sheehan, 2006). This is particularly pertinent to our study as 98% of the health care providers—whether professionally or in the home—are women. And with these theories and challenges in mind, we turn to what health practitioners and community members in coastal Newfoundland had to say about the potential and problems of ICT in their communities.

Research Site

As noted above, our research site was five small outpost communities on the southwest coast of Newfoundland. Lincoln and Guba (1985) believe it is extremely important to carry out research in natural settings because it is here where the full realities around issues can be best understood. It is crucial to preface our brief descriptions of the health care and education services in these five communities by stating that three of them are under serious threat of relocation by the provincial government. Declining populations, the collapse of inshore fisheries, and few employment opportunities for youth have had vastly negative impacts. These communities are seen as costly to run, since ferries, post offices, and schools for few children are still required (Clover & Harris, 2005). One nearby community was closed and the population moved just as we began our research. Another has since been relocated. As one travels along the coast by ferry, the only remnants of once vibrant fishing communities are graveyards. The residents of the remaining, lovely little communities nestled along the coast, however, are fiercely devoted to where they live and do not want to share the same fate.

The first community, Grand Bruit has a population of 36 and is accessible only by public ferry (five days a week), private boat, helicopter, or snowmobile in winter. There is a small clinic, but the female staff member, who primarily dispenses drugs, has little or no health training. Burgeo, the largest community of the five, with a population of approximately 1,500, has both a road and major ferry access to all the other communities and a medical centre with nurses and doctors. Ramea is a small island with a population of approximately 600. The island has a clinic with two full-time nurse

practitioners and a receptionist and frequent ferry service to Burgeo and Grey River. The nurse practitioners in Burgeo and Ramea provide different types of health education services to all the communities. Grey River and Francois each have populations of approximately 150 people. They have clinics, but, again, the women who manage them have limited health care training. These two communities share the same accessibility as Grand Bruit in terms of air, land, and sea. The weather in the North Atlantic—as we experienced a number of times over the course of our three-year study—is volatile, and ferries are often cancelled. Health care providers prefer to travel to and from the outposts by helicopter, since they are more expedient, albeit more costly.

Methodology and Methods

The purpose of our qualitative case study was to explore the problems and potentials of ICT in terms of increased access to health care and preventative education. As noted above, we recognized from the outset that BBS had implemented the ICTs (video conferencing and broadband Internet) with all good intentions. As members of these communities, board members hoped ICT would have potential in terms of providing health and other services. Health Canada provided funds solely for the video conferencing and accompanying diagnostic equipment. BBS received other funding to introduce broadband Internet. Although we were primarily concerned with the video conferencing, it quickly became apparent that broadband access was having an impact on health education and knowledge creation.

Unstructured face-to-face interviews provided one method of data collection. Unstructured questions focused on major obstacles to using the technology, who was using the equipment and for what purpose, training and educational aspects, and ideas for the future. We conducted in-depth interviews with nine health care providers (nurse practitioners and educators, a female doctor, and two clinical administrators) and six female community members. We also did follow-up interviews in the second year to see if things had changed. The unstructured interviews took place in either the clinics or the women's homes, depending on their choice. Each interview was taped, fully transcribed, and then sent back to the woman for comments, edits, or additions. A second method we used was focus groups. Between two and four people took part in the three focus group sessions. All of those interviewed were women, since they make up the bulk of the family health care providers and the health care professionals who live in and travel throughout the small communities. We did not tape the focus groups, but took notes on flip charts, which we used as a source of data. Focus groups were held in the clinics.

We began our analysis by allocating the data manually from the interview transcripts and flip charts under two major categories: problems and potentials. Within these, we coded common themes, watching for any major differences amongst the communities or between professionals and community members. All participant names are pseudonyms.

ICT, Community Health Care, and Education

Problems of ICT

Three interconnected themes in the problems category emerged from the data. The first was technical capacity, which had a major effect on its perceived impact and value. The

second was fear of further erosion to health care, education, and the community as a whole. Third, there emerged a complex relationship between technical training and pedagogy. This included a clash of values and visions around training as well as human contact and personalization in community health care and education.

Current technical capacity/capabilities

All interviewees and focus group participants noted, in one way or another, current limited technical capabilities of the video conferencing. Jeannie stated that the equipment would be really useful in terms of health education only "if we could get connected to the other four communities." One of the reasons for this would be to cut back on travel; "that would be heaven, oh, the travelling we could save, oh my, especially in the winter." But, in fact, the equipment can currently connect only two communities at any one time, and that is unlikely to change unless there is a substantial investment in new equipment. A second problem related to capacity is range. Ina, a nurse practitioner, argued that for this equipment to be really useful in her own education, "it would need to be able to take part in a meeting in Cornerbrook [because] that is the hub where all the health policy and training stuff we do is taking place." Cornerbrook is a three-hour drive (and much longer if you also need to take the ferry before you get to the road) from Burgeo, and current ICT will never reach that far.

Familiarity with the video conferencing equipment and its location also plays a role in terms of the problems of capacity and usage. Anna referred to the equipment in Burgeo, housed in the hospital's boardroom, as "a little bit out of the way." This out-of-sight, out-of-mind problem was emphasized by one director, who noted that physicians "just don't look to it to use it because it's not where they need it." A third angle on this comes from Jane, who also works in the Burgeo hospital: "The equipment is not really used in our area. The big thing is the physicians. I don't know if they are not comfortable in using it or if they just don't look to it to use it." One major issue these women are raising is training and pedagogy, and we will return to this shortly. But they are also raising a red flag in terms of the current ineffectiveness of the video conferencing and the possible consequences, for, as Charlotte noted, "if you are not used to using it, in an emergency, you won't think to use it." Not thinking to use the equipment is a direct result of not being consulted about the equipment in the first place, and this was the case throughout the communities. None of the health care practitioners or community members was actually asked if they wanted this equipment. "Asked? No, I was never asked [laughs]. No one was ever asked," said Cleo. In other words, neither the patients nor the caregivers felt they had any power or control over health restructuring in general or the video conferencing equipment in particular, and this has led to deep frustration and an unwillingness to use the equipment.

When practitioners did attempt to use the video conferencing, the quality of reception and the number of breakdowns posed major problems. As Denise explained, "It [video conferencing] broke down and I just figured it out [but then] we had a little bit of difficulty because we lost the sound signal once, and then we lost the image." Losing the sound and picture on video conferencing renders it useless and simply creates more work. For example, when the sound went, the Ramea nurse found herself using the telephone and trying to deal with this new and added problem. Although Picot (1998) argues "the Canadian climate and geography are particularly well-suited to the adoption of

communications technologies for long-distance medical care” (p. 199), the number of breakdowns in these communities—most often associated with inclement weather—tells a very different story.

But there are other serious problems with the inadequacy of the technical capacity, and one is “the patient’s right to confidentiality, security of information and privacy [which] must be respected,” noted Cleo. One participant told the story of when the machine was left on in the clinic, and people in another site were actually able to see and hear what was going on. Although this incident did not happen when confidentiality was an issue, nevertheless, stories travel fast in these communities and it caused a great deal of unease. “I could be using it . . . but I don’t know if the security is there now. These kinds of things have to be worked out before we can use it,” said Charlotte. Many actively questioned the ability of this equipment to provide the high level of confidentiality necessary and are highly sceptical that the problem has been fixed. “Yes, that [it is said to be fixed now and won’t happen again] is from the BBS’s perspective but from Health Care’s it is not . . . You are talking about the transfer of health and you have to be really sure before you tap into it,” said Anne.

Finally, many respondents questioned the political will to deal with the issue of sustainability and the constant need for new and updated equipment. For the video conferencing to be most effective, a number of diagnostic pieces are required. “Well, you know if you want to see inside someone’s throat over that thing well you’ve got to have the equipment. And the equipment costs money. I don’t see the politicians running down here to give us the money” (Cleo). Ione adds: “It’s not really good enough not to keep updating this stuff [technology] and adding to it. It’s like sort of well now it’s here so use it. But technology changes and you are always running to keep up.”

Interestingly, broadband access (which also often went down due to volatile weather) was seldom spoken about in the same derogatory manner used to refer to the video conferencing. This is probably because the video conferencing was the most specific to health care and education in the minds of practitioners.

Fear of further erosion

There was an overall acknowledgement of the gradual erosion of health care and education taking place over the years. The three smallest communities have been particularly hard hit in terms of the almost total removal of on-site services. One doctor, who, along with her husband, had been practising medicine in Burgeo for the last 16 years, made this point:

I know of the clinics, [but] I haven’t been there unfortunately. My husband was the one who travelled. We were asked to do the coastal clinics because the area was most of the time serviced by the physicians from Ramea. And after those physicians were gone, the nurses and the nurse practitioners serviced directly.

When asked when these clinics were discontinued, she replied, “it was five or six years ago when the last physician left.” She went on to describe the present health care situation and the nurses’ shortened stays in the coastal communities. “Often the weather is closing in and the helicopter pilot just wants to get out of there, limiting the

nurse's time with patients and the possibility that a patient or two may not be seen." Linda, a nurse practitioner, confirms this and adds:

We say we are providing services but we are not. I don't know how people can do it . . . getting the services is not made easy; you have to be very motivated . . . Over the long term it won't be sustained. It is certainly not good service to these rural communities.

But recognizing problems with the health system and accepting the technology as the answer were two different things. To put it mildly, people are suspicious and cautious of anything coming into their communities that could further reduce health care. On the other hand, many are fiercely determined to stay in their communities and fight any efforts to have them relocated, as this comment by Beverly shows: "Well, if it [the community] dies, it's gonna die fighting hard. It's going down fighting."

Fiona articulated, quite succinctly, something we heard over and over again in a variety of ways from community members and practitioners about the ICT health care system: "We don't want to see it [ICT] replace nurses and doctors." They made connections between health care and relocation. For example, Ione asked this very provocative question: "So we've got this video conferencing in the clinic as I understand it and if we don't use it can they [the government] just say we are not willing to change or help ourselves and then shut down the community?" While we would not say this is a tactic of the government, it does reveal the deep concern around policies of relocation in the province of Newfoundland and Labrador that so many shared.

Technical training and a caring pedagogy

Two different aspects to training and education emerged. The first was training in terms of learning to operate and use the equipment. As can be gleaned from the above findings around technical capacity, we learned through our conversations with the various health care workers that their level of training to use the equipment ranged from none to minimal. For example, when we asked the female doctor in Burgeo about her knowledge of the video conferencing technology and whether she had received training, she replied, "No, no, no, not at all, not at all." Terry, who runs one of the small clinics, said she had training, "but it was done too fast because the trainer could only stay as long as the helicopter was scheduled to stay." Although the health care system funded the video conferencing installation, and there is a trainer, things are not going well. The trainer is also the only person who can fix faulty equipment, and that is pretty much a full-time task. As he noted when interviewed, there has been no extra funding to assist him in any way.

Within training we find the issue of pedagogy, and this poses perhaps the biggest challenge to ICT use. Fiona articulated one of the key problems quite well: "The language the trainer uses is important. It was too technical so it [made] you feel uncomfortable." Sharon added another layer: "What I like to do is find out first what the technology is good for, what it can actually do. You know, talk about what it can be used for. Then that tells me what things I would want to learn about it." What these two women are saying is that there is a disconnection between training on one hand and education and learning on the other. Studies show that women are often more cautious than men around technology, less comfortable with using and learning it in general, and,

overall, share a less than positive attitude toward it (Coupal, 2002; Whitely, 1997). While some believe this is because computers and computer education are male-dominated and permeated with sexism (Coupal, 2002; Millar, 1998), we would add that it is also because the technical rational framework of training does not provide the holistic learning process the women seemed to want. Rather than simply exploring the how-to of technology, they wanted the why and, more importantly, the so what.

The second area within this theme is preventative health education. While many nurse practitioners felt that some health education presentations would work well through video conferencing, and we will address this shortly, more spent time sharing educational values and why they felt this technology was simply not suitable. As Ina explained:

It is very impersonal. It is not the comfort level, it is just not appropriate. To do or to teach women to do breast exams they can't touch the models, feel the bumps in the breast; the same if you are playing a game and you had to pass a ball. Even if you send the equipment [models, balls, etc.] down [to the community] ahead of time that would tie up the equipment. And I think people wouldn't like it that u nfe.. d

was also open to doing online counselling, since she has almost no travel budget, but only if confidentiality could be guaranteed. Another nurse practitioner-educator noted that she and a colleague "were talking about doing some kind of diet/cholesterol clinic" using the technology. Others talked about how the video conferencing could be used for things like aerobics and other cardiovascular activities. Farquar, Behnke, Detels, and Albrigh (1997) have found in their study that mass media education campaigns directed at entire communities can, in fact, be quite effective in reducing the risk of cardiovascular disease. Rather than using a tape at home to do aerobics or waiting for nurse practitioners to come to the community, residents could access the video conferencing equipment to have aerobic sessions two or three times per week. Some of the health practitioners also felt that more frequent intra-community dialogue would be useful, since, as Anne noted, most health problems "are cross-community, such as diabetes, obesity, and inactivity and growing problems of alcohol and drug abuse."

The director of nursing saw the possibility of using the video conferencing equipment for staff meetings if the four outside connections could be made simultaneously. "It is so difficult now for the staff to come in for meetings or training. I would like to have all connected for at least general staff meetings."

As our research was concluding, we did notice that the video conferencing was beginning to be used for diagnostic purposes, and interviewees provided a number of examples. Elena has used it twice, once when a young boy broke his arm and another time when an elderly lady had a rash. The doctor in Burgeo who was on the receiving end of the boy's needs said that being able to see the boy and get a look at his arm "was definitely much better than just having a conversation with the nurse." The doctor's ability to see the elderly woman's rash prevented the patient from having to take the ferry. This responds to studies that argue that technology is cost-effective and that it is extremely important in these rural areas.

While the funding from the health sector has predominantly gone into video conferencing, and that is primarily what the interviews and focus groups focused on, broadband Internet access was also installed and was having a most interesting effect on health education of the community. Particularly during the interviews, many women talked about the ways they were using the Internet to research and gain knowledge about specific health problems and treatments. For example, Beth searched the Internet to increase her understanding of diabetes. "I got to wondering a bit about what else there was to know . . . so I went online and there is so much information." Adding to this, Ione exclaimed, "You won't believe what you can find on the Net. I had this problem, you see, so I looked it up and well, then I knew when I went to the doctor!" Taken together, these comments provide food for thought in terms of power, control, and equity, which we discuss below.

Discussion

Power, control, and holistic learning—as well as the threat of relocation under which three of the communities live, declining populations in the other two, and the devotion to community by all those who remain—provide the framework for our discussion of the findings and their implications for ICT health care and education on the southwest coast of Newfoundland.

Communities are sites of struggle and negotiation; spaces within which power is both exercised and contested. Power is also exercised and contested both around and through technology, and this complex interaction was certainly evident in our study (Feenberg, 1999; Feenberg & Hannay, 1995). Given the socio-economic context of our research sites and the pervasiveness of technical rationality around health care and as an educational tool, it is perhaps easy to understand why, on the one hand, people are reluctant to use the video conferencing. Problematically, the video conferencing was simply placed into the community without prior consultation. This has, in many ways, undermined the power and authority of the female health practitioners who are the backbone of the health system. Perhaps this is a reflection of what Botting (2002) has found. She notes that over the past two decades, “the power base of nurses, traditionally female, has been eroded and so has their influence over decisions” (p. 26). The installation of equipment without prior discussion with these women has proven to be deeply problematic, since they refuse to use the video conferencing, something we address shortly. Compounding this are problems with transmission signals and confidentiality, which are frustrating at best and terribly worrisome at worst. Many Newfoundlanders also continue to believe that technology “played a major role in the destruction of the fisheries” (Clover & Harris, 2005, p. 29). There is a pervasive, deep, and understandable concern that technology will mean even fewer practitioners and less service. Armstrong and Armstrong (1996) and Botting (2002) have noted a direct correlation between technology and declining staff across the board in health care. Technology is an economic instrument, although we realize it brings important innovations to health care (Picot, 1998). Therefore, we must understand community concerns within this broader context of a government firmly focused on cost reductions and a people firmly committed to preserving their community. Chovanec and Foss (2006) refer to this as a larger picture that governs health care and education. For the technology to be effective in these communities, it needs to be understood and used as a tool—what Feenberg (1999) refers to as the servant—and not an instrument that leads to the demise of community.

Linked to the above are complex aspects of training. Numerous adult educators lament the major emphasis on skills training in adult education, and rightly so (Fenwick, Nesbit, & Spencer, 2006). But it seems here that training would have been a major asset in terms of actually using the equipment. In other words, it seems an exercise in futility to spend money on equipment and then neglect to train people to use it properly. Perhaps this is simply a case of what Winner (1996) described as “technological somnambulism” (p. 72)—a deep and unwavering faith in technology’s ability only to positively affect the human condition, even if it is not actually working well. As this has been “cultivated over decades [it] will not be easy to overcome” (p.72). But community members and practitioners, in their more pessimistic moments, wonder about the true motives behind the equipment in terms of health care, but also, more broadly, community resilience. No further funding has come either for training or to upgrade existing equipment, and this seems to be something that should have been built in at the beginning.

And yet, having said all of this, we see active moves to regain power and control over technology and the communities’ futures that give hope for change. Alongside a sense of ICT powerlessness is a complex and encouraging contestation and visioning. The refusal to use the equipment if it was not located where it would be useful, or if people felt confidentiality was at risk, showed a powerful act of resistance and a taking

back, albeit in a small way, of control. But power was exercised not only in the form of refusal, but in the generation of ideas for future health education activities. The majority of the ideas focused on prevention, collective learning, and intra-community learning, demonstrating what Chovanec and Foss (2006) have seen as an important shift from "disease management to disease prevention and health promotion" that went well beyond the traditional responses, which are simply to teach people "how to manage various health conditions and diseases such as diabetes" (p. 218). It would also be interesting to see, in terms of community resilience, if ideas for intra-community connections could help to bring people together to build a stronger collective voice to fight for community survival under a neo-conservative threat. Health education through ICT could become a dynamic platform for more "planned social action and learning" (p. 274).

Linked closely to the above, nurses' teaching and caring is grounded in a context of human connectedness, bonding and attachment (Botting, 2002; Yeatman & Nove, 2002). This is where we saw the keenest sense of the limitations of ICT. The philosophy of respect and face-to-face, hands-on (literally) learning was too deeply engrained to be usurped by ICT. The nurses' approach of valuing, knowing, and caring as fundamental to community health education was in direct contrast to what they saw as the distant and clinical nature of the video conferencing. It is here where the link is made most strongly between health and adult education for broader awareness and action. It is also here where we see a more contemporary version, through ICT, of Freire's empowerment health education (Wallerstein & Bernstein, 1988). Ideas for interactive and group aerobics activities through the video conferencing, for example, transform health prevention into physical action and meet the demands of "both the individual and the community" for active control of health (Obilade, 2005, p. 275).

But empowerment education went even further. While none of the professionals mentioned using the Internet for their work, many female community members talked of using this medium to make more informed choices and develop their understanding of health problems and issues. This knowledge could not only reduce health risks, but increase quality of life (Chovanec & Foss, 2006). It also empowered the women when dealing with members of the medical profession, because they had a greater knowledge of their own problems. But perhaps there should be a caution when it comes to the Internet. There is a great deal of trash online, and anyone can publish anything they like. Information from U.S. pharmaceutical companies abounds, and with much persuasion, they silkily suggest you use their products or ask your doctor if certain drugs are good for you. It would be important to work with nurse practitioners to create a pedagogy of questioning when it comes to the Internet, while also supporting people's initiatives to take control of their own health. While recognizing the empowering potential of self-directed learning and research vis-à-vis health care, health media literacy—as a component of the broad health literacy strategy that Chovanec and Foss (2005) articulate so well—would be truly valuable. To us, this would be what Fleming (1989) calls a technological literacy—a critical and imaginative understanding of socio-technical systems and their impacts on health and society. However, the limited training and knowledge nurse practitioners and other health educators have on and about technology mean they are unlikely to be of much assistance.

Conclusion

Technical problems, issues of confidentiality, lack of technical and pedagogical training, and a clash of values greatly hinder the usage of video conferencing telehealth in these five communities. There is also a healthy concern that the technology will further erode, rather than enhance, existing health provision. Health practitioners realize that much of their educational work, based on a philosophy of caring and face-to-face contact, should never be undermined by technology, and they demonstrate remarkable agency and power in determiningg

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