

Reference: Milliken, M., O'Donnell, S., Gorman, E. (2009) How K-Net and Atlantic Canada's First Nation Help Desk are using Videoconferencing for Community Development. Journal of Community Informatics, 5 (2).

How K-Net and Atlantic Canada's First Nation Help Desk are Using Videoconferencing for Community Development

Mary Milliken

National Research Council, Fredericton, Canada

[<mary.milliken@nrc.gc.ca>](mailto:mary.milliken@nrc.gc.ca)

Susan O'Donnell

National Research Council, Fredericton, Canada

[<susan.odonnell@nrc.gc.ca>](mailto:susan.odonnell@nrc.gc.ca)

Elizabeth Gorman

National Research Council, Fredericton, Canada

[<l7bt2@unb.ca>](mailto:l7bt2@unb.ca)

Abstract

Our research is working in partnership with three First Nations organizations - K-Net, Keewaytinook Okimakanak in Sioux Lookout, Ontario; Atlantic Canada's First Nation Help Desk in Membertou, Cape Breton, Nova Scotia; and the First Nations Education Council in Wendake, Quebec - that have set up videoconferencing networks linking First Nations communities spread out over large geographic areas. Initially set up for educational and health purposes, the application, reach and scope of these communication networks have expanded since the mid-90s to include cultural, social, and community development activities. Qualitative data collected in fifteen in-depth interviews with technical and administrative staff at K-Net and Atlantic Canada's First Nation Help Desk reveal how both their relationship-building approach to networking, and their repurposed applications of videoconferencing, have supported development in the First Nations communities they serve.

Introduction

The VideoCom project examines how information and communication technologies, particularly videoconferencing, are being used by First Nations people and communities for social, economic and community development. Our research partners Keewaytinook Okimakanak (KO) in Sioux Lookout, Ontario, Atlantic Canada's First Nation Help Desk in Membertou, Cape Breton, Nova Scotia, and the First Nations Education Council (FNEC) in Wendake, Quebec are three First Nations broadband service providers. These organizations have established broadband networks that serve a wide variety of community types and sizes, spread out over large geographic regions. Initially these organizations focused on setting up technical systems to provide better access to educational, and then health institutions and services. As their technical capacity and expertise have both grown, these providers have expanded the scale, number and types of interactions that they support.

This exploratory paper draws on interviews with staff and associates of the broadband service operated by KO called K-Net, and Atlantic Canada's First Nation Help Desk about their various uses of videoconferencing and how it contributes to community development. This research provides context for a subsequent project that examines the perspectives of community members on video communications.

Research Context

Community development is challenging for rural and remote communities in Canada, which is the situation for most First Nations communities. Limited local infrastructure, restricted access to resources and isolation often make it necessary for community members to travel to other locations for a wide variety of needed services. Not only is travel expensive and time-consuming, the necessity of leaving home for what many urban-dwellers would consider basic services encourages a pattern of community depletion rather than development. In addition, First Nations communities have often faced language and cultural challenges when dealing with agencies based in distant English or French-speaking urban centres (Beaton, 2004).

The Canadian federal government has implemented programs to encourage greater connection between rural and remote First Nations communities and health and education providers using information and communication technologies, such as First Nations SchoolNet (Bale, Brooks, Grummett and Tymchak, 2005) and Telehealth (Muttitt, Vigneault and Loewen, 2004). The benefits and challenges of deploying information and communication technologies in rural and remote communities are not just economic, but also social and cultural. Measuring the success of any policy that deals with the deployment of technology requires that one look beyond what the technology produces or accomplishes, to see how it impacts other areas of the society (OECD, 2001; Ramirez, 2007).

For any policy to be effective, it must address local realities and needs. The traditional top-down model of regulation that has existed between the federal agencies that set policy and provide services and the First Nations communities affected by those decisions is no longer considered adequate; a closer connection between all parties is fundamental to the success of any policy (RMOs, 2008). Local stakeholder input is critical for all levels of policy formulation and evaluation to more accurately

identify how information and communication technologies (ICT) may or may not contribute to various aspects of community development (Ramirez, 2007).

In the past, video has been a useful tool for recording local, contextually-grounded and immediate interpretations at the local level when policy decisions have been implemented in First Nations communities. For example, the “Fogo Process” (Ferreira, Ramirez and Walmark, 2004) describes how films made by community members convinced provincial and federal government agencies to reverse plans to relocate Fogo Island communities in Newfoundland. When sent back to policy makers, the important messages of the people who lived in the communities, conveyed through these videos, enabled an interactive process of policy design (Ferreira, Ramirez and Walmark, 2004).

In a similar vein, K-Net actively facilitates relationship-building between various providers to align their services with the needs of the local recipients. The provision of video and videoconferencing networks by K-Net and Atlantic Canada’s First Nation Help Desk has enabled communities to develop more interactive connections with government organizations for greater self-definition and control over their own economic and social development (O’Donnell et. al., 2009a). The broadband providers have taken an active role in developing community capacity and skill with the goal of fostering self-reliance. Their approach has been to “...*give them the tools and see what they build ... and then people like K-Net are continually finding new tools to show them how to build stuff*” (Interviewee E).

The aforementioned providers have opened up access to these forms of ICT, and adapted them to meet a wider variety of uses and community-based needs. Since 1994, the telecom and ICT branch of Keewatinook Okimakanak Tribal Council, K-Net Services, has provided and supported the hardware and software that connects First Nations communities in northern Ontario not only to institutions and agencies that provide different services, but also to each other. The subsequent growth of videoconferencing in remote and rural communities cannot be attributed to any policy decisions imposed by government agencies. Rather, it has come from the initiatives of First Nations providers and their collaborative approach to developing the networks through partnering with communities (Fiser and Clement, 2008). Videoconferencing is now being used to connect distant family members, for language, culture and tradition preservation (Beaton, 2004), and for community development efforts (Beaton, Fiddle and Rowlandson, 2004; O’Donnell et. al, 2009a).

It must be noted that the benefits of videoconferencing are limited by the degree to which local capacity can overcome technical challenges, limited user knowledge and comfort, the methods of content production, and social relations within (O’Donnell, Molyneaux and Gibson, 2010) and between organizations (O’Donnell et. al, 2009b). In addition, the low level of support offered by external organizations may also hinder these communities in achieving their visions for ICT applications (O’Donnell et. al., 2009b)

Research Method

This paper explores how two First Nations organizations and the community members they serve are currently using ICT, specifically videoconferencing, for

community development. Research was conducted with two of the VideoCom research partners, K-Net, based in Sioux Lookout, Ontario, and Atlantic Canada's First Nation Help Desk (ACFNHD) based in Membertou First Nation, Cape Breton, Nova Scotia. The perspective of the third VideoCom research partner FNEC is not represented in this study because it joined the VideoCom project after the data was collected.¹

The VideoCom project uses a participatory research approach that strives to employ the OCAP principles of ownership, control, access and possession toward self-determination of Canadian First Nations in research (Schnarch, 2004). All of the partners meet regularly by videoconference to share information, participate equally in decision-making, participate actively in research as well as provide feedback.

K-Net's broadband network serves 70 First Nations and more than 30 non-Aboriginal communities in Northern Ontario, Northern Manitoba and Northern Quebec (Fiser, Clement and Walmark, 2006). The ACFNHD network serves 30 sites spread throughout four Atlantic-Canadian provinces. Both organizations provide broadband connectivity and services to First Nations schools and regional management organizations for the federal First Nations SchoolNet program (O'Donnell et al., 2009a).

Qualitative data were collected in fifteen in-depth interviews with all members of the Atlantic Canada's First Nation Help Desk staff and almost the entire K-Net staff, and thus constitute a representative sample of these organizations. Interview transcripts were analyzed using NVivo analysis software to explore how videoconferencing between two or more sites has contributed to community development. Interviews were coded for videoconferencing about non-health and non-education related issues, community development initiatives, and obstacles and challenges. We do not assume that these findings represent the views of all First Nations broadband providers. Instead, we suggest that insights obtained from this research may be useful for other remote and rural communities facing community development challenges.

Benefits of Videoconferencing

Combining real-time audio and visual connection, videoconferencing simulates face-to-face interaction. Videoconferencing point-to-point and between multiple locations has been used widely in the business, telemedicine and distance education sectors, and is an attractive alternative to physical travel for its financial, environmental and time savings (Molyneaux, O'Donnell, Fournier, and Gibson, 2008). Rich in social presence (Short, Williams and Christie, 1976), videoconferencing offers intimacy, immediacy and the potential for a greater level of engagement than other text or audio-only tools of communication.

In order to ensure equal quality of service between locations, certain technical requirements must be met (Liu, Molyneaux and Matthews, 2008). Effective use of videoconferencing equipment relies on certain good practices by the participants involved to ensure appropriate levels participation and knowledge retention (Molyneaux, O'Donnell, Fournier and Gibson, 2008). The key variables that affect the level of participation in videoconferencing are: the technical infrastructure at and between locations, the interaction between users and the technology, how the content is presented in the session, and the group dynamics, not only at each location but between them as well (Molyneaux et. al, 2008).

Our research partners, while using pre-existing and proprietary software and hardware, are capitalizing on the inherent potential of the technologies themselves. By developing community-oriented communication networks, they are using technological networks to maintain the integrity of these remote and rural communities. In so doing, KO and ACFNHD have avoided the technological development trap identified by Hollan and Stornetta of focusing on the creation of a sense of “being there” for videoconference participants (1992). In attempting to replicate known conditions in traditional face-to-face interaction, technology developers have been blinded to the potential of different levels and types of engagement made possible by ICT, that could take participants “beyond being there” (Hollan and Stornetta, 1992). In addition, as broadband service providers, our partners may be able to offer *multiscale communication* (Roussel and Gueddana, 2007) to remote and rural First Nations communities through combining videoconferencing with various other communication technologies.

The scope of these community-based networks and the variety of the applications, in addition to the level of engagement made possible by the technologies themselves, allow these communities and community-based organizations to use videoconferencing as a tool to further their own development goals.

Community Development

Frank and Smith’s (1999) definition of community development encompasses the range of views expressed by the interviewees in our study, describing it as the process by which communities

... become more responsible; organize and plan together; develop healthy options; empower themselves; reduce ignorance, poverty and suffering; create employment and economic opportunities; and achieve social, economic, cultural and environmental goals” (Frank and Smith, 1999, p. 6).

While most of our interviewees emphasized one area or another for development, for some, community development held a range of meanings, such as:

... Creating opportunities, supporting local development opportunities, in particular, capacity building, so that the communities ... can be making decisions and doing the work themselves as much as possible, and sustaining their own economy, sustaining their own livelihoods, and building stronger and healthier communities (Interviewee B).

Community development is a controversial and interpretive term because “*The word ‘development’ has a certain bias to it, as if what you are starting with is undeveloped ... In another situation in another group of people, it could mean something very different*” (Interviewee K). One interviewee suggested that one way to overcome this confusion would be to measure the progress of community development using determinants of health² such as “... *economic development, looking at housing, looking at education, health and infrastructure ...*” (Interviewee D).

Our research partners pointed out the need for communities to direct their own change for it to have lasting effects because “... *A change from the outside never does*

anyone any good in those places ..." (Interviewee J). It is equally important that all community development goals reflect the different needs of each community. Identifying projects that are locally important means that "*...the community (will) develop that, and work within it so that it's initiative and a reflection of the community, and they're a part of it; it's just not a structure that's separate from them*" (Interviewee M). Until now, the pattern of decision-making has been the reverse with "*...government making the big decision and it's just top-down; but ideally you would like to see it from grass roots, up*" (Interviewee D). The most positive changes have occurred when government officials have invested time, developed relationships and learned from the local people about what they need (Interviewee B).

First Nations Uses of Videoconferencing

In the past, for residents who lived in remote First Nations without permanent roads into the communities, the only way to access many resources and services was to fly outside the community (Interviewee G). Meeting with service providers by videoconference instead of travel saves both time and money. The institutional applications of videoconferencing have been primarily in the areas of health and education. K-Net and the ACFNHD support point-to-point and multi-site videoconference meetings between individual communities, provincial organizations and community members (Interviewee F). The broadband providers also use videoconferencing for their daily business, not only for practical reasons but also to encourage use by example (Interviewee N).

There are other uses of videoconferencing than tele-health and long-distance education, as well as other benefits. Videoconferencing can be used to record and archive important cultural traditions, language for example since "*The true language is being lost ... there's a lot of terms and slangs that are overriding a lot of the original language that the elders have. So I think if the language was gathered and captured now, then it would be preserved and that way it wouldn't be lost*" (Interviewee C). Other non-institutional uses of videoconferencing have included recording cultural traditions so as to increase understanding of community histories (Interviewee M). Artist collectives, such as a musical group comprised of a drummer, singer and dancer, have connected for collaborative work across distances (Interviewee D). Maintaining relationships is another use of the network.

Recurring themes that emerged from the interviews identified the potential uses of videoconferencing as an interactive technology for building connections between individuals and communities, building capacity within communities, and contributing to the efforts of Canadian First Nations toward self-determination and identity self-management.

Building Connections

The possibility that community goals may not match those of outside agencies and funding partners is an ever-present risk for First Nations communities when they cannot participate in meetings with policy makers in distant locations. Presenting local concerns at regional meetings of different First Nations organizations is not always possible either, due to travel time and cost barriers. Videoconferencing encourages more frequent and different types of interaction between partners. For example, the

Atlantic Health Board typically meets three or four times a year, and wanted to add meetings with community-based health directors. Representatives from a First Nations health director in Cape Breton had budgeted to attend up to two meetings a year in person, but there was no additional time or financial resources available for more frequent meetings. Using videoconference technology instead of travel is "... wonderful. I'm just so glad that I don't have to travel five hours to the next meeting; that I can just go over here and just hook up. We've been using videoconferencing probably the last three years ... at those rates, at least 60 times a year, and I know that it just simplifies things" (Interviewee D).

Videoconferencing has provided opportunities for wider engagement when events or meetings are happening at a distant location. If the resources exist to only send one person to a meeting in person, adding videoconferencing means that a wider array "... and more people could participate. So you have more people learning, more people commenting" (Interviewee L). For example, when a health organization books speakers in Halifax, ACFNHD organizes "... speakers to present to community on certain issues - -speakers that are in Halifax -- usually we'll get them to present through our videoconferencing at our corporate office. I think too, even with the health sessions like on the pandemic puzzle, I think that we had the elementary school hook up to that conference" (Interviewee D).

Capacity-Building

The second theme is how the collaborative approach taken by K-Net and the Atlantic First Nation Helpdesk towards technological service provision and development builds capacity within communities, and enables communities to contribute to their own development. In addition to linking communities technologically, these First Nations broadband providers facilitate the building of inter-community and person-to-person relationships, all of which create "... more interaction ... to build a stronger network of people" (Interviewee N). The model of technological networking and knowledge-sharing can be adapted to serve local needs, cultures, and aid in knowledge transmission and cultural expression between the individuals and communities spread across different First Nations.

As time passes, the broadband provider changes the type of services and support they offer the individual communities. As capacity increases, communities can potentially "... move initiatives forward themselves, to develop their own community and have ownership of that" (Interviewee L). K-Net and ACFNHD continue to provide or promote content if needed, but as the local communities become increasingly comfortable with the equipment, they start to generate their own content. As summarized by one informant in our study, "... all we have to do is be there to support and promote it ... (and) turn the network to the communities. It's theirs to do with what they wish in terms of the network (Interviewee J).

With many traditional industries in decline, technology can also present opportunities for communities "...to look into new industries and to support building the capacity to have those industries in their towns" (Interviewee L). The community is encouraged

... to own that broadband connection, to turn it into their own ISP, internet service provider. And then, in turn, make that a business case and allow them to

perhaps hire ... becoming self-sustaining of that network, of their own network that they own, and they can bring in more applications (Interviewee G).

Self-determination and identity management

First Nations autonomy, self-governance and self-determination can only happen through a process of “... *building the community by building capacity in people and in organizations through training, through experiences, through relationships*” (Interviewee F). The benefits of expanding the videoconferencing network collaboratively have been at least two-fold, not only by building technical capacity in the communities, but also through creating networks of relationships. These human networks have fostered greater understanding of the issues affecting communities, and a growing sense of awareness and self-confidence, all of which are necessary for self-determination.

More efficient communication between distant communities has replaced the need for travel and raised awareness of important issues, the effect of which has been a greater participation and cooperation of the population in making changes (Interviewee F). Community members dealing with organizations and institutions that are distant and culturally different, now have more control over how they represent themselves and their interests. Video communication technologies also allow First Nations people to take more control over their identities, and to manage how they appear “... *to other people outside of Canada. Not only outside of Canada, but outside of this region within Canada*” (Interviewee C). By sharing an understanding of what it means to be First Nations in Canada, there is a better chance that First Nations communities will have the tools and support to further their own development.

The videoconferencing connection not only increases local capacity, but its varied uses also provide opportunities for self expression in cultural and artistic activities that can now be more easily shared between different First Nations and communities. As formerly isolated communities are able to interact more easily and often through videoconference, they develop confidence” ... *in their culture, and their tradition, and they would express themselves artistically or through communication*” (Interviewee F). K-Net, as the broadband provider, “... *facilitates those expressions, and also their abilities through training, and also through the communication platforms; so their expression and their training, I would say, support their self-determination*” (Interviewee F).

Obstacles and challenges

Our interviewees agreed that connecting communities to their institutional partners, as well as to each other, by videoconference has contributed to local development. However, there have been limitations that need to be overcome. The areas of difficulty cited by our partners are not only related to infrastructure, but also to the availability of training for staff and users, as well as access to reliable funding.

Various technical challenges limit the use of videoconferencing by First Nations communities for community development. Variation between the types of equipment can interfere with inter-community connections. Technical issues commonly occur when firewalls and equipment are not compatible (Interviewee J). Since access to communications technology is dependent on the physical location of the equipment and

adequate bandwidth, challenges arise that are related to the overall infrastructure in a community. Unlike urban centres where equipment and bandwidth for web-based communications are available at places like public libraries with extended hours, on reserves

“...that physical spot where our connectivity ... is the school. So a) the schools don't have libraries; b) they don't have extra meeting rooms or classrooms for people. They are already stressed for space so they don't have the capacity to be able to do their work or their sharing from a particular location. Thirdly, those locations are by and large closed down by four o'clock, by weekends”
(Interviewee I).

While some communities have multiple sites with videoconferencing capacity, others may only have one or two locations (Interviewee H) so that even if the technology and bandwidth are in the community, peoples' access to it is limited.

Beyond the technological limitations, some locations *“...don't have enough manpower to do it, and there's too many communities to work with as a whole”* (Interviewee C). There are varying levels of experience between communities that could be evened out by a system that allows for building capacity, training and rotating staff. Another personnel-related issue is that *“... staff turnover in a community is high. Leadership turnover is high. Every two years there's a new council elected”* (Interviewee H). As it is now, when a person leaves a job in a local community, the expertise leaves with them (Interviewee D).

Finally, established practices and expectations within the community can place limitations on how the technology is used (Interviewees I, J). Our partners identified the need for raising awareness about videoconferencing services, since people living outside the communities may not be aware that they are available (Interviewees A, M). One technique was to introduce and develop different initiatives in the community that would introduce people to the technology, increase their familiarity and encourage their use of it (Interviewee F). Sometimes additional incentives have helped. In one example, the initial meeting by videoconference with remote partners about a particular topic attracted a large turnout from the local community. However, subsequent meetings were poorly attended (Interviewee D). The situation reversed when organizers employed a strategy of offering door prizes and a draw for attendance (Interviewee D).

The problems associated with equipment compatibility, the availability of staff and technical infrastructure is directly related to the levels (Interviewee A) and reliability (Interviewee B) of funding. Funding is a constant challenge because there is no single source that is stable (Interviewee B) for either technical or support activities. Costs are higher in remote and rural regions than in urban centres for deploying broadband. To encourage the communities to use the networks, our partners need funding over and above the technical infrastructure costs to *“... decrease the actual community cost so the service becomes affordable”* (Interviewee G).

There are no sources of funding for continual training opportunities for staff in different locations, which would help overcome the disparities in experience between them and encourage consistency in practice and applications. Finally, users also need funding and support to help provide much needed training for local community

members. Even when users know about the equipment and bandwidth in their community and can access it, many still need training, support and encouragement to use it.

Conclusion

K-Net in Ontario, and the Atlantic Canada's First Nation Help Desk in Cape Breton, Nova Scotia have set up and are using their videoconference networks to encourage community development. In effect, videoconferencing in northern Ontario and the Atlantic region has the potential to enable communities to achieve the "... *social, economic, cultural and environmental goals*" (Frank and Smith, 1999) they identify as being important.

Prior research, supported by more recent interviews with partners K-Net, Keewaytinook Okimakanak and Atlantic Canada's First Nation Help Desk, highlight the necessity for stakeholder involvement at all levels of policy design, implementation and evaluation. Our partners' activities and successes prove that the traditional pattern of external organizations imposing policies, technologies and practices on First Nations communities is neither effective nor appropriate. First Nations people are capitalizing on the social presence of videoconferencing to increase their interaction with remote institutional partners and influence the intended target, design and implementation of policies that affect them. These First Nations broadband providers have developed videoconferencing networks that enable communities to connect with their institutional partners and other communities, to work together to make decisions and plan actions: in other words, to exercise their constitutional right to self-determination.

Community development relies on a drive to improve existing conditions and there is no doubt that there are real problems that need to be addressed: First Nations in Canada have higher rates of injury, suicide, diabetes and lower rates of educational achievement than their non-First Nations counterparts (Canada, 2009). Technological and human networks allow creative expression and connection between community members that have contributed to greater self-awareness, more control over identity and a growing confidence in First Nations cultures. The non-institutional uses of videoconferencing that have contributed to a greater sense of control over identity and community-based decisions about priority issues can contribute positively to any development goals in the institutional areas of health and education. Additionally, the model of community-run infrastructure has the potential to build capacity, create employment and encourage economic opportunities.

The first recommendation from this research is that First Nations have access to reliable and sustained sources of funding to support their work on self-determined projects that contribute to community development. Additional support is needed from the agencies, service providers and institutions that First Nations communities deal with. To enable First Nations community development, we recommend that public institutions improve their capacity to communicate via the means chosen and developed by their First Nations partners. By following the lead of First Nations communities who use ICT for various communication purposes, these institutions and agencies have the opportunity to gain a greater understanding of the local realities of their clients, and improve their efficacy accordingly.

Acknowledgements

The VideoCom project is funded by a SSHRC (Social Sciences and Humanities Research Council of Canada) grant for 2006-2009 and 2009-2012, with in-kind contributions from the National Research Council, Keewaytinook Okimakanak, Atlantic Canada's First Nation Help Desk, the First Nations Education Council and the University of New Brunswick. The authors would like to thank the interview participants who contributed their thoughts and ideas to the study and to the KORl, K-Net and Atlantic Helpdesk staff who hosted the research visits.

References

- Bale, D., Brooks, P., Grummett, J., and Tymchak, M. (2005). *Research on First Nations E-Learning in Western Canada*. Regina: University of Regina and First Nations SchoolNet RMO responsible for Saskatchewan and Alberta.
- Beaton, B. (2004). The K-Net Story: Community ICT Development Work. *Journal of Community Informatics*. 1(1), 5-6.
- Beaton, B., Fiddler, J., and Rowlandson, J. (2004). Living smart in two worlds: Maintaining and protecting First Nation culture for future generations. In M. Moll and L. R. Shade (Eds.), *Seeking convergence in policy and practice: Communications in the public interest*. Vol. 2, 283-297. Ottawa: Canadian Centre for Policy Alternatives.
- Canada, H. (2009). *A Statistical Profile on the Health of First Nations in Canada: Determinants of Health, 1999 to 2003 (Statistical profile)*. Ottawa: Health Canada.
- Ferreira, G., Ramirez, R., and Walmark, B. (2004, September 18). *Connectivity in Canada's Far North: Participatory Evaluation in Ontario's Aboriginal Communities*. Paper presented at the Association of Internet Researchers, Pre-conference workshop - Measuring the Information Society: What, How, for Whom and What? Brighton, UK.
- Fiser, A., Clement, A. (2008, June). *The K-Net broadband deployment model: Enabling Canadian Aboriginal community control of telecom infrastructure through relationship building and heterogeneous engineering*. Proceedings of the IEEE International Symposium on Technology and Society (IEEE ISTAS 08). Fredericton, NB, Canada.
- Fiser, A., Clement, A., and Walmark, B. (2006). *The K-Net Development Process: A Model for First Nations Broadband Community Networks*. Working paper. No. 2006-12: CRACIN.
- Frank, F., and Smith, A. (1999). *The Community Development Handbook: A tool to develop community capacity*. Ottawa, ON: Human Resources Development Canada. URL: http://www1.servicecanada.gc.ca/eng/epb/sid/cia/comm_deve/cdhbooke.pdf.
- Hollan, J., and Stornetta, S. (1992, May 3-7). *Beyond Being There*. Paper presented at the ACM Conference on Computer-Human Interaction (CHI'92). Monterey, California, US.
- Liu, S., Molyneaux, H., and Matthews, B. (2008). *A Technical Implementation Guide for Multi-site Videoconferencing*. Paper presented at the IEEE International Symposium on Technology and Society (ISTAS 08). Fredericton, NB, Canada.

Molyneaux, H., O'Donnell, S., Fournier, H., and Gibson, K. (2008). *Participatory Videoconferencing for Groups*. Paper presented at the IEEE International Symposium on Technology and Society (ISTAS 08). Fredericton, NB, Canada.

Molyneux, H., O'Donnell, S. (2009, October 3-6). *ICT and Health and Wellness in Remote and Rural First Nations Communities: A Social Determinants of Health Perspective*. Paper presented at the Canadian Society of Telehealth Conference (CST 2009). Vancouver, BC, Canada.

Muttitt, S., Vigneault, R., and Loewen, L. (2004). Integrating Telehealth into Aboriginal Healthcare: The Canadian Experience. *International Journal of Circumpolar Health*. 53(4), 401-414.

O'Donnell, S., Molyneaux, H., and Gibson, K. (2010). A Framework for Analyzing Social Interaction using Broadband Visual Communication Technologies. In T. Dumova and R. Fiordo (Eds.), *Handbook of Research on Social Interaction Technologies and Collaboration Software*. 528-541. New York: IGI Global.

O'Donnell, S., Perley, S., Walmark, B., Burton, K., Beaton, B., and Sark, A. (2009a) Community Based Broadband Organizations and Video Communications for Remote and Rural First Nations in Canada. In Stillman, L., Johanson, G., and French, R., (Eds.), *Communities in Action*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing. 107-119.

O'Donnell, S., Perley, S., Simms, D., Hancock, B-R. (2009b, Summer) Video Communication Roadblocks Facing Remote Indigenous Communities. *IEEE Technology and Society Magazine*. 28 (2), 16-22.

OECD. (2001). *The New Economy - Beyond the Hype*. The OECD Growth Project. Paris: OECD.

Ramirez, R. (2007). Appreciating the Contribution of Broadband ICT With Rural and Remote Communities: Stepping Stones Toward an Alternative Paradigm. *The Information Society*, 23(2), 85-94.

RMOs. (2008). *A New First Nations ICT Federal Policy and A First Nations National Broadband Network. Part One and Two*. Presented by the Regional Management Organizations, FNS SchoolNet. March 2008. Ottawa: Regional Management Organizations, First Nation SchoolNet.

Roussel, N., and Gueddana, S. (2007). *Beyond "Beyond Being There": Towards Multiscale Communication Systems*. Paper presented at the MM'07. Augsburg, Bavaria, Germany.

Schnarch, B. (2004). Ownership, Control, Access, and Possession (OCAP) or Self-Determination Applied to Research: A Critical Analysis of Contemporary First Nations Research and Some Options for First Nation Communities. *Journal of Aboriginal Health*, January, 80-95.

Short, J., Williams, E., and Christie, B. (1976). *The Social Psychology of Telecommunications*. Toronto: John Wiley and Sons.

¹The Conseil en Éducation des Premières Nations-First Nations Education Council (CEPN-FNEC) joined the VideoCom project in 2008, 15 months after these interviews were conducted with the two original partners.

2Health Canada has identified twelve determinants of health: "income and social status, social support networks, education and literacy, employment/working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetic endowment, health services, gender, culture" (<http://www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php>, accessed May 7, 2009; Molyneaux and O'Donnell, 2009).