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Abstract:
This paper provides an overview of policies and strategies for broadband infrastructure and access, and broadband video communication development and use in First Nation communities in Canada. Although using broadband for video communication remains underdeveloped in First Nation communities as a whole, successful initiatives have been underway for many years, particularly in the areas of distance education and telehealth applications. The research conducted to date on broadband video in Aboriginal communities has focused almost exclusively on evaluations of distance education and telehealth applications, which have primarily been positive evaluations. There has been little research on other kinds of applications. The authors discuss approaches to doing research with Aboriginal communities. Clearly there are many opportunities for researchers to investigate and explore the possibilities of broadband video communication for First Nations across Canada. However researchers working on these projects in First Nation communities will face a number of challenges. The authors discuss these challenges and outline some ways forward. Before First Nation communities develop broadband video communication applications, concrete First Nation community-specific planning and development that looks at the needs, priorities, and long-term goals of the community and its members must be fully addressed.

Broadband Video Communication Research in First Nation Communities

Background: Canadian "digital divide" policy and ideology

In recent years there has been a push by the Canadian government and its agencies toward increasing access to broadband Internet and bridging the "digital divide" experienced by disadvantaged groups. The digital divide is conceived as the gap in Internet access and information and communication technology (ICT) use among different social groups and geographical regions.

Researchers have explored the economic and political motivations for making the digital divide an issue in Canada (Clement and Shade, 1998; Gurstein, 2003; Birdsall, 2000; Rideout, 2000). Before this gap was fully conceived, an ideology gained acceptance that emphasized a free market concept of allocation of Internet infrastructure and information technology. This was in contrast to the notion of universal access to telecommunication infrastructure and services that Canadians have long embraced as a core national value. In the early 1990s, the Information Highway Advisory Council, with membership consisting of ICT industry representatives and spear-headed by Industry Canada, recommended that the federal government create a competitive environment fostering consumer-driven development of Internet services. Further, government ICT policy pushed the concept of "Connecting Canadians" to ensure a large consumer base that would attract private sector funding to build the infrastructure for broadband Internet, thus creating an economic boost.

Government left broadband development in the hands of the market, assuming that a free market economy based on competition would make accessibility easier and more affordable. However, with information considered a commodity and with no real government regulations around connectivity or access, the private sector set the standard for broadband access as those consumers who can afford it. The idea of a division based on those who have access and those who do not was recognized in the 1990s. Birdsall (2000) suggests that the debate on the digital divide will continue but will likely shift from the elimination of the digital divide to merely defining "only how large or small it should be," resulting from a lack of a clear definition of what universal access means and how public policy can achieve this in Canada.

Further, the questions around access for what, for whom and for what purpose remains a fundamental issue (Clement and Shade, 1998). Discussion of access to broadband has largely revolved around infrastructure and access to consume while ignoring the developments of strategies for effective use of ICT by marginalized groups "to support local economic development, social justice and political empowerment; ensuring local access to education and health services; enabling local control of information production and distribution; and, ensuring the survival and continuing vitality of indigenous cultures" (Gurstein, 2003). If access remains as "simple access to passive consumers" then real opportunities will remain in the hands of a select few who provide the services, and design and produce the information on the internet while the marginalized groups continue to be at a disadvantage economically, socially and politically (Gurstein 2003).

Policies and strategies for broadband infrastructure and access in First Nation communities

Aboriginal people throughout Canada have historically been at a disadvantage compared to other Canadians due to the effects of colonization and assimilation practices by the colonial powers. These effects "continue to resonate in the present and the harm done in the past continues to manifest intergenerationally in the present" (Wesley-Esquimaux and Smolewski, 2004:5). Given the federal government's market-driven policies for broadband Internet that encourage access to ICT by those who have the financial means to afford it, it is no wonder that Aboriginal groups are among those on the wrong side of the digital divide in Canada.

With the emphasis now on ICT as a means to elevate social conditions, empower marginalized groups and increase potential for economic opportunities (Clement and Shade, 1998; Gurstein 2003), it stands to reason that many marginalized groups such as First Nations have jumped at the opportunities to access the financial resources provided by the government to start developing strategies for accessing and using broadband Internet.

To date, the federal government has engaged in consultations and meetings about broadband access with Aboriginal groups and stakeholders but there is no clear coherent government policy on broadband and Aboriginal communities. Until very

recently, Indian and Northern Affairs Canada (INAC) – the federal government department with primary responsibility for First Nation issues – did not develop broadband as a program area and thus did not fund broadband or ICT development in First Nations. However other government departments have funded broadband research and development in First Nations. Industry Canada has taken the clear lead with funding programs such as Brand, First Nations Schoolnet and the Community Access Program in First Nation communities. Health Canada, Heritage Canada, Human Resources and Social Development Canada, and Justice Canada are among the other federal departments involved in funding programs related to broadband in First Nations communities. In early 2006, INAC announced a new program to develop an "Aboriginal Single Window" on the web to deliver services to First Nations and other Aboriginal communities in Canada.

Parallel to these policy and program developments, in 2004-2005, Aboriginal Voice, a project of the Crossing Boundaries National Council, was engaged in consultations about ICT with Aboriginal peoples across Canada. The focus of the project was to provide a means by which Aboriginal people would provide input and create awareness of the unique issues, challenges and opportunities of Aboriginal peoples concerning ICT. Aboriginal Voice resulted in reports outlining the feedback from the roundtable dialogues with Aboriginal people, as well as publications that discuss the benefits and challenges of ICT in Aboriginal communities and concerns about the "digital divide" among Aboriginal communities (Crossing Boundaries National Council, 2006).

Some First Nation organizations and communities across Canada have used the financial resources offered by the federal government to develop plans for implementing and accessing broadband infrastructure for their First Nations. The Assembly of First Nations (AFN), one national group representing First Nation people in Canada, has moved forward on a mandate to address the digital divide among First Nation communities and has adopted resolutions concerning broadband access by all First Nations. Aside from access to broadband, the AFN has highlighted the need for continued funding in order to sustain and maintain broadband technology once access has been delivered in First Nation communities (Assembly of First Nations, 2001). Given the many competing community priorities First Nation leadership are confronted with that concern the welfare of their community members, and considering the limited core

funding dollars they receive, they are hesitant to put any of these dollars towards broadband and ICT initiatives. So there is a need for resources that go beyond providing access to broadband.

The Atlantic Policy Congress' (2002) report "An Atlantic First Nation Information Communications Technology Vision and Strategy" provides an excellent overview of a comprehensive plan for developing an ICT agenda for the Atlantic First Nation communities. Based on roundtable dialogues with key players from First Nations, government, private sector and educational institutions, the recommendations reflect a holistic approach to developing an ICT plan that not only takes into account the needs and priorities of the First Nation communities but also looks at ICT implementation as determined by the community and essential to the community plans. One recommendation is for a structure that would provide "guidance and help to mobilize and coordinate capacity" for training staff at the community level (APC, 2002). Further, the overall strategy promoted in this document also suggests that it could be "tailored to the different starting points within individual communities, with collaboration among First Nations at a regional level (as) a key principle" (APC, 2002). This strategy is suggested to be adaptable to all the First Nations in the Atlantic Provinces. However the APC plan has not received the resources necessary to proceed.

The First Nation Technology Council in British Colombia was established in 2003 by the First Nations Summit Chiefs in Assembly in response to the recognized need determined by the First Nation communities to address and develop the technological capacity and skills among their community members. The FNTC mandate was to develop a plan that would look at infrastructure development, access, skill development and technical support. Funding was sought from both Federal and Provincial government sources. The FNTC website (www.fntc.info) provides a comprehensive list of services including but not limited to their strategic plan, policies, handbooks, and other resources that may be useful for other First Nations in their planning for broadband infrastructure development, access and use.

Broadband video communication development and use in First Nations

To date, policy and program initiatives to develop broadband infrastructure and capacity in First Nations have not made the distinction between "high speed Internet" and broadband capable of sustaining real-time audio and video communication. Alberta, British Columbia and New Brunswick have broadband infrastructure development programs to extend high-speed Internet to all First Nations in these provinces, and high speed Internet is also available in many First Nation communities in other provinces and territories. However although high speed Internet allows faster email or Web browsing capabilities, it does not guarantee the quality of service required for reliable broadband video communication.

In contrast, broadband that allows reliable video communication – including video chat, multi-site videoconferencing, video podcasting and streaming videos on the Web – offers more potential for First Nations to achieve their social, economic, cultural and political aspirations. Video communication on broadband can be used not only for distance learning and telehealth but also for delivering government services (including Aboriginal government), delivering community news and information, increasing the participation of Aboriginal and other citizens in a range of social, economic, political and cultural activities, and sharing and promoting common perspectives.

Currently, the use of broadband video communication varies among First Nations. Variables include the availability of broadband infrastructure, technical and financial capacity to use broadband video, knowledge about and capacity to act on opportunities, and others. Although using broadband for video communication remains underdeveloped in First Nation communities as a whole, successful initiatives have been underway for many years, particularly in the areas of distance education and telehealth applications.

Leading the field in broadband video communication by and for First Nations is Keewaytinook Okimakanak (KO). KO is a non-political Chiefs Council in Northern Ontario (www.knet.ca/info.html). The KO division K-Net provides web, Internet, satellite and videoconferencing services and infrastructure to remote communities in Northern Ontario. K-Net has an ongoing relationship with Industry Canada. As Industry Canada's

Aboriginal Smart Community, K-Net is recognized internationally as a leader in Aboriginal ICT and connectivity. They work with the FedNor, BRAND, SITT, SchoolNet, and CAP programs and other partners to provide community broadband connectivity solutions using public benefit transponder resources available from Telesat Canada.

Distance education is a relatively developed area for broadband video communication by and for First Nations. First Nations SchoolNet is a sophisticated user and promoter of videoconferencing for education. The six First Nations SchoolNet regional management organizations (RMOs) across Canada are working in their particular regions to advance broadband infrastructure and applications in the First Nation schools and communities. Videoconferencing is now recognized as an important component for supporting the required type of broadband infrastructure required in these communities. As such, the RMOs in the Atlantic, Quebec and Saskatchewan and Alberta regions are now expanding their services to include their own videoconferencing bridging hardware and support. The six RMOs are:

- Atlantic Canada First Nations Helpdesk (Sydney, Nova Scotia)
- The First Nations Education Council (CEPN-FNEC, Wendake, Quebec)
- Keewaytinook Okimakanak (K-Net, Balmertown, Ontario)
- Keewatin Tribal Council (Thompson, Manitoba)
- Keewatin Career Development Corporation (KCDC, La Ronge, Sask)
- First Nations Education Steering Committee (FNESC, Vancouver, BC)

Many educational projects using broadband video have been developed by and with First Nations. The Keewaytinook Internet High School (http://kihs.knet.ca/) is the first secondary school in Ontario to offer accredited courses using broadband Internet. KiHS was created for youth living in small isolated First Nation communities in Ontario who previously had to leave home to attend high school. Music Grid is an innovative project using broadband video communication for teaching music including to pupils in Kangiqsualujjuaq (northern Quebec) and Iqualuit (Nunavut). The Adult Education department of the Cree School Board teaches adult upgrading classes at the secondary level via video conference to three First Nations communities in Northern Quebec. A number of Canadian universities use videoconferencing for distance education of nurses in First Nation communities.

Telehealth is another area where broadband video communication is relatively developed. Many hospitals, universities and medical centres across Canada use broadband video for telehealth applications in First Nations communities. KO Telehealth (KoTH) links patients in 24 remote and isolated communities in the Sioux Lookout zone with physicians and specialists in Winnipeg, Thunder Bay and southern Ontario. Its services have been expanding to include tele-psychiatry and tele-radiology. KoTH is the only telehealth network in Canada managed and operated by Aboriginal people.

Where the broadband infrastructure is available, some Aboriginal people – especially young people - are exploring the entertainment and personal educational possibilities of video through applications and devices such as video iPods, webcasting videos (music videos), video games, and video cell phones. However broadband video content made by and for First Nations - for games, iPods, webcasts and so on – remains very limited. The Aboriginal Peoples' Television Network (APTN) streams several promotional videos from its website (www.aptn.ca) but has not made its programs available online. Some websites by First Nation individuals and organizations have entertainment and personal education videos available for viewing or downloading (see, for example, Cal Kenny's site (http://calkenny.myknet.org/). A number of projects are in development. The Aboriginal Cultures and Traditions Storytelling website (http://cado.ayn.ca/index.asp) has audio content but so far no video content. The I'powahsin Project (http://www.ucalgary.ca/~jparker/I'powahsin/index.html) at the University of Calgary and Red Crow College in Alberta is developing a portable Game Boy game to assist the teaching of the Blackfoot language.

Research and approaches to research on broadband video in First Nations

The research conducted to date on broadband video in Aboriginal communities has focused almost exclusively on evaluations of distance education and telehealth applications, which have primarily been positive evaluations (see Bale et al., 2005; Keewaytinook Okimakanak, 2005; Masum, Spence and Brooks, 2005; Muttitt et al., 2004; Aitkin et al., 2004; Elias et al, 2004; Ramirez et al., 2004; Fiser, 2004b; Care, 2001 and 2003; Downing, 2002).

Aside from education and health applications, there has been little research on broadband video. Fiser (2004a) has been investigating broadband and community economic development in the KO communities. Ferreira et al. (2004, 2004a) has been exploring participatory video and policy development.

A significant development in 2004 was the establishment of the Keewaytinook Okimakanak Research Institute (KORI) by the KO Tribal Council. KORI conducts research on the use of ICT for the advancement of Aboriginal issues and facilitates connections between researchers working in this area and KO communities. KORI was one of the founders of RICTA, a network of researchers working on ICT research with Aboriginal communities (Kenny, Walmark and O'Donnell, 2005; Walmark, O'Donnell and Beaton, 2005).

We have articulated some approaches to doing research with Aboriginal peoples that are also relevant to research on broadband video communication research (Perley and O'Donnell, 2005). Our five suggested approaches to research are:

- Building a relationship, partnerships and collaborations with First Nations
- Developing First Nations' priorities for research
- Developing researchers' self-awareness of how their upbringing and education have shaped their cultural biases, motives and perspectives
- Integrating the political, socio-economic and historical contexts of the research
- Expanding the borders of the researchers' academic discipline, methodologies and theories

Below we discuss these five approaches in the context of conducting research on broadband video communication.

Building a relationship, partnerships and collaborations with First Nations

First and foremost, building a relationship based on mutual trust and respect is a vital beginning before any concrete decision can be made to conduct research with First Nation people. There has been a long history of discontent among First Nation people regarding researchers coming into their communities. This discontent stems from

misinterpretation of information provided by First Nation people, lack of Aboriginal voice or perspective in the research and writing of First Nation people and the appropriation of First Nation cultural information, just to name a few (Perley and O'Donnell, 2005). However, most important is the long history of colonization and assimilation practices that has had and continues to have devastating impacts on First Nation people.

In essence research with First Nation people must involve collaboration with First Nation people to understand their priorities and needs for research. The researcher needs to be upfront with their motives and clarify their reasons for wanting to undertake a specific research project with First Nation people. Ultimately it would be in the best interest of both parties to come together to reach a common agenda or goal for research that will encompass the researchers' and First Nation's priorities in order to avoid suspicion and misunderstanding of the researcher and the research project.

It should be noted that despite some commonalities among Aboriginal people such as colonization and oppression, Aboriginal people are very diverse. With this in mind it should also be noted that First Nation communities are at different levels, economically, socially, politically and technologically. So, the researchers should be aware of these differences and take them into account when researching broadband video with First Nations. Further they would need to assess the level of awareness of broadband technology and the differences between the technologies and capabilities. While some First Nation communities are at an advanced level of technology implementation and services provided, such as KO, who have developed partnerships for technology development and are ready to enter into new agreements for research on broadband video communication there are still many First Nations who are not. Therefore, it would seem that there are different categories of technological levels and capacity within First Nations and so they would be at different starting points in research. However, the priority for both categories would be to develop a common agenda for research and to do this would involve partnership and dialogue with First Nation people who are interested in community development initiatives that involve communication development to promote local capacity and community empowerment.

Developing First Nations' priorities for research

Along with developing partnerships and collaboration with First Nations in research it is also important to identify and dialogue around the First Nation communities priorities. Researchers can assist the First Nation community to develop and organize their priorities as long as they do not try to influence their personal agenda to conduct research with the community. The final decision about the research agenda or whether the community participates should ultimately be in the hands of the First Nation community members.

Community collaboration through forum dialogues with community members would ensure that the community is informed about the research and it would be an avenue that allows for feedback to both the researchers and the community leaders, as to the priorities and needs of the community and what is in the best interest of the community. It would be through collaboration efforts such as community forums that the researcher should state the motives behind the research. If there is a commercial aspect linked to the research than the community can decide on the extent of involvement in the research or how the community would directly benefit from it. There should be some form of reciprocity to the First Nation community providing the information for the research project.

The ultimate goal of broadband video research with First Nation communities should be to assist First Nations in recognizing how technology can be used to empower, and by providing the tools to using technology as they see fit in their communities. Further, it should ultimately help the community build the capacity to use technology as an instrument to self-determination.

Developing researchers' self-awareness of how their upbringing and education has shaped their cultural biases, motives and perspectives

"The craft of research begins with a desire to search for truth, illuminate knowledge and improve quality of live" (Kenny et al., 2004:3). If this is the essence of research then a vital process in research would call for researchers to reflect around self-awareness and how their culture, education and upbringing have shaped their biases, motives and

perspectives. This would help in their understanding and sensitivity of how race, class, and gender has privileged very few while marginalizing many, such as First Nation people. If research is the desire to search for truth and knowledge then it is important to question what constitutes truth and whose knowledge is being accepted and privileged.

It should be further understood that certain knowledge and information developed by the privileged has been what is valued, taught and accepted in the western education system while Indigenous knowledge has been silenced. Therefore, more Indigenous scholars are challenging the assumptions within western academic research and writing by shifting to a new paradigm that stresses the need for more "Indigenous people and Indigenous researchers setting the parameters and priorities of the research, its ethics, responsibilities and methodology" (Perley and O'Donnell, 2005:6).

Integrating the political, socio-economic and historical contexts of the research

First Nations experience power and resource imbalances that have developed during centuries of exploitation and neglect of First Nations by mainstream Canadian society. The Royal Commission on Aboriginal Peoples (1996) found that the Canadian government has not honoured historical agreements made with Aboriginal peoples. Instead, it has replaced the historical agreements with policies aimed at removing Aboriginal peoples from their traditional lands, suppressing Aboriginal nations and their governments, undermining Aboriginal cultures and stifling Aboriginal identity. Research on broadband video in First Nations needs to take into account this historical context and the resulting political and socio-economic realities experienced by First Nations today.

Some key challenges associated with this historical context include, among others, the low levels of formal educational achievement and the relative lack of science and engineering skills across First Nations populations. Few First Nations people are actively participating in ICT and broadband video research and development today. Given that First Nations' voices are largely absent from discussions and developments related to broadband video, researchers have a particular obligation to seek out First Nations voices – for example the leaders involved in the First Nations SchoolNet program – to ensure these views and the wider political, socio-economic and historical contexts are integrated into the research.

Expanding the borders of the researchers' academic discipline, methodologies and theories

Researchers working on broadband video in First Nations need to be open to crossing the traditional boundaries of their academic discipline as well as considering other perspectives and knowledge sources. This is a critical but new research area in the multidisciplinary context. A number of researchers have generated research within their specific disciplines – such as broadband policy, broadband infrastructure, participatory video in First Nation communities and so on – and research innovation will require genuine collaboration with Aboriginal communities and approaching research that incorporates the many different and divergent perspectives.

Broadband video in First Nations is a prime area for multi-disciplinary research. It encompasses engineering and computer sciences – for designing and developing software and hardware applications and broadband infrastructure -- as well as social sciences and humanities disciplines that focus on the broader political, socio-economic, cultural and historical contexts of the First Nations involved in the research. A considerable challenge is that technology research and development, including information technology such as broadband video, has traditionally involved engineers and computer scientists working on development teams without consideration of the broader social contexts and without any significant input by social scientists or user communities. The research infrastructure in Canada is rigidly separated between "hard" scientists developing technology and "soft" scientists researching human and social contexts. The main Canadian research funding bodies – NSERC (for hard science) and SSHRC (for soft science) and CIHR (for health research) – do not have mechanisms to encourage working together on technology and social science teams. In addition, although participatory research with First Nations is encouraged in many SSHRC and CIHR disciplines it is not required, and within the NSERC disciplines of software and hardware engineering and computer science it is virtually unknown.

Challenges for research and development

Clearly there are many opportunities for researchers to investigate and explore the possibilities of broadband video communication for First Nations across Canada.

However researchers working on these projects in First Nation communities will face a number of challenges.

First Nations have many concerns about the well-being of their community members, and broadband Internet is not a top priority for First Nation leaders when compared to other pressing priorities such as housing and economic development. Many First Nations do not fully comprehend the positive impact broadband could have in their communities. Collaborative efforts will be required involving all the stakeholders, especially the members of the community targeted for broadband infrastructure.

Considering that broadband is not a high priority, it goes without saying that broadband video communication technology is also not a priority for these communities. The equipment needed for broadband video communication is an additional cost to having a computer and an Internet connection. Moving beyond planning and development of broadband infrastructure to implementing high-end technology such as video communication applications requires significant investment in infrastructure, equipment and maintenance. Very few Aboriginal communities have the resources necessary to use broadband video communication effectively.

Across Canada, broadband infrastructure that can support video communication is located primarily in urban centers. The infrastructure is underdeveloped in rural and remote areas, which ultimately discriminates against the Aboriginal communities largely located in these areas. Broadband infrastructure development is largely market-driven. Rural and remote First Nation communities with small populations are not a priority for commercial broadband service providers, and First Nation communities themselves do not have the financial resources to allocate to broadband infrastructure. One promising initiative is the recent CRTC decision that directed commercial telecommunications companies to make provisions in rural and remote areas - this initiative is in the early development stage at the time of writing.

For those Aboriginal communities closer to urban centers or those with broadband service, the cost of broadband service is often too great for many community residents who are barely able to keep up with their utility or phone bills. The cost of broadband is a

challenge shared with other low-income communities; it is not a priority in many low-income households because of other more pressing needs.

Many Aboriginal people, especially the older population, are not familiar with computers and the Internet and are therefore not interested in or are intimidated by using ICT. Computer literacy assumes literacy in the English language, creating a barrier for those whose primary language is an indigenous language as we still see among the older populations in Aboriginal communities (Gigler, 2006). As well, for those Aboriginal people who have minimal western education, "the Internet's content is written in a rather academic or business style, and thus is not directly applicable at the grassroots level" (Gigler, 2006:128-129). Further, the "Internet is a very 'western' medium and needs to be appropriated by the poor communities before any real benefits can be derived" (Gigler, 2006:128). Effective use of broadband video communication must take into account the literacy rate of the First Nation community members. Online learning using broadband video must also take into account the learning styles of the First Nation culture and the individual.

Opportunities are limited for training in ICT within or near Aboriginal communities, and further, if there is training available it usually covers only the basic computer applications or software. Individuals taking part in this training are often staff members or those at a higher academic level thus maintaining the gap in the digital divide within Aboriginal communities. Given that basic ICT training is limited in many Aboriginal communities, the high-end training to use, maintain and upgrade video communication technology is not available to the community residents.

Many of these challenges go back to the need for a comprehensive planning strategy developed by or in collaboration with the First Nation community. Aside from distance education and telehealth, the other applications and advantages of broadband video for Aboriginal communities are not very clear. A better and more thorough understanding of the direct benefits to investing in broadband Internet needs to be considered and addressed at the local community level. Even with the widely published and accepted view that ICT can be empowering for marginalized groups or communities, it is not necessarily a given end result. Without considering the many challenges and developing strategies to address them from the local grass-roots level, then the broadband video

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communication research or development project will merely have a financial draining or dust-collecting presence without providing any real positive impact on the First Nation community.

The right to self-determination has been an ongoing battle with the governments of Canada and as part of this self-determination it is necessary for the government to realize that Aboriginal people want to thrive and make their community and members healthy and self-sufficient. However this will not be achieved as long as the governments continue to make decisions affecting Aboriginal people using a top-down approach. This is true for broadband infrastructure and access in Aboriginal communities that this far have been minimally involved in federal decisions regarding the "Connecting Canadians" agenda.

The approach should be community participation in a communication development strategy that stresses "access and with that access having the knowledge, skills, and supportive organizational and social structures to make effective use of that access and that e-technology to enable social and community objectives" (Gurstein, 2003). This can only be achieved through community member involvement in the strategies that affect their community and personal well-being. The communication strategy can be incorporated or in line with community development initiatives, with possibilities for researchers taking on the role of providing assistance in assessment and evaluation of what technologies may be appropriate and effective for the local First Nation communities. Participatory action research may be the best approach for researchers involved with broadband video research with First Nation communities to ensure that community members are involved in all aspects of the research (Gurstein, 2003).

First Nations want to bridge not only the digital divide but also the other social divides that set them at a disadvantage to other Canadians. However broadband access and ICT is not the answer but rather an instrument that may, if properly implemented, help them after other social conditions are recognized and dealt with appropriately.

Providing broadband access in some of these environments without any real consideration of the social, political and economic conditions or effective leadership may breed more discontent in their community. Without understanding the overall history of

First Nations and the environment in which they live, plans that are forged by the government without appropriate collaboration with the members are set for failure. This has been played over and over again. Governments take charge, set a plan, consult with First Nations after the agenda is set, provide inadequate financial assistance to gain cooperation with leadership, and attempt to implement a plan that has no membership cooperation or collaboration. This approach sees failure before it begins. The government will take credit for assisting First Nations, First Nation leaders will have access to financial resources, and those on the top end of the First Nation community hierarchy will benefit, thus resulting in very few actually benefiting from the government's initiative.

Another challenge for researchers is ensuring that ethical concerns have been addressed. In Canada, all research involving contact with humans must undergo an ethics review that follows the guidelines in the Tri-Council Policy for Ethical Research Involving Humans (TCPS). Section 6 of the TCPS, which covers research involving Aboriginal peoples, is a brief introduction followed by a short bullet-point list of good practices that researchers should consider. Section 6 is currently being re-drafted to include more comprehensive guidelines for researchers, with the draft guidelines available in 2006 for comment. Collaborations and dialogue efforts involving Aboriginal people are underway to revise Section 6 that will take into account various concerns around research for Aboriginal people such as the valuing and incorporating of Indigenous knowledge in research. Researchers need to recognize that First Nations have a lot to offer in terms of different understandings of technology and development and the contribution of their knowledge needs to be acknowledged in the research.

Currently the Canadian Institutes for Health Research (CIHR) offer the most comprehensive guidelines available to researchers doing research on First Nations issues. The guidelines are available on the web at: http://www.cihr-irsc.gc.ca/e/29339.html. Key issues outlined in the draft guidelines include requirements for the researcher to comply with the expectations and protocols of First Nations regarding traditional or sacred knowledge; that First Nations retain the rights to their knowledge, cultural practices and traditions shared with the researchers; that First Nations should be offered the option of a participatory research approach; that research must be of mutual benefit to the community and researchers; that researchers

should support the development of education, research and training (including training in research ethics) for Aboriginal peoples and communities; that researchers should make the best effort to translate publications or reports into the language of the community; and that First Nations have rights to control and determine their proprietary interests in the collection, use, storage and potential future use of data. Related concerns that researchers need to familiarize themselves with are outlined in the OCAP principles (Schnarch, 2004).

Conclusions

First Nations in Canada have increased their demands to address the information and communication technology (ICT) gap or the "digital divide" in and among First Nation communities. First Nation leaders have recognized that this divide is a significant barrier to possibly reducing or overcoming many economic, social and educational challenges that hinder First Nation people and their communities from reaching a greater potential, and to creating more opportunities for First Nations. In order to become significant players in a growing global economy, First Nations need to become more aware of the benefits of broadband (high-bandwith Internet) and specifically broadband video communication.

Before First Nation communities move forward with setting up and incorporating a broadband infrastructure, concrete First Nation community-specific planning and development that looks at the needs, priorities, and long-term goals of the community and its members must be fully addressed. Since many First Nation communities are at different stages in addressing the various social, economic, education and political issues, it is important that planning for broadband development be addressed at the local community level rather that at a regional or national level despite some common factors.

Broadband research can provide the necessary information on the pros and cons of broadband video communication development as it relates to the community development plans of a specific First Nation community. So, linking broadband research and assessment with the First Nation community development plans as a collaboration effort between researcher and the community would provide for a more meaningful

approach for the First Nation community, possibly leading to more realistic recommendations that the community can actually use. Other areas that have potential for broadband research include community assessments of ICT (skills, awareness, use, capacity, resources etc.), assessing the potential and opportunities for First Nation women, youth, elders, persons with disabilities, the impact on tourism and economic development, assessment and evaluation of educational training, health, and cultural preservation. Ethical issues around research with First Nations needs to be a major consideration in the development of any type of research project. Researchers must be aware of the ethical guidelines and protocols in research as well as those that are specific to the First Nation and culture being considered for the research.

Researchers must have a thorough understanding of the research concerns of and the specific challenges facing First Nation people before introducing the idea of broadband video communication to a community. Broadband video communication can have a positive impact on marginalized groups or communities, as evidenced by the positive assessments of distance education and telehealth initiatives. However, before any real positive change or impact can be seen, many hurdles that may hinder the fruition of this effort must be overcome. The diversity of First Nation communities and their needs must be recognized.

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