*J*ournal of *R*ural and *C*ommunity *D*evelopment

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Citation:
Carpenter, P., Gibson, K., Kakekaspan, C., & O'Donnell, S. (2013). The How Women in Remote and Rural First Nation Communities are Using Information and Communications Technologies (ICT). In W. Ashton & A. S. Carson (Eds.), [Special issue]. *The Journal of Rural and Community Development, 8*(2), 79-97.

Publisher:
Rural Development Institute, Brandon University.

Editor:
Dr. Doug Ramsey

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ISSN: 1712-8277
www.jrcd.ca

How Women in Remote and Rural First Nation Communities are Using Information and Communication Technologies (ICT)

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Abstract

First Nations women have a strong role guiding the success of their family and their community. In the past, women nurtured their family, ensuring their food and safety. These responsibilities are still true today with the added challenges and opportunities of modern day life. In Northern Ontario, many remote and rural First Nation communities are connected to integral services via broadband. The current study explores how First Nations women are using information and communication technology (ICT) and if the technology can address some of their challenges and open up new opportunities. Two hundred and thirty one women living in remote and rural First Nation communities in Northern Ontario completed an online survey, sharing their thoughts and experiences with regard to: ICT use in daily life, ICT for health and wellness, ICT for cultural preservation, and what is needed to support their effective use of ICT. The findings suggest that the women in these remote communities are active users of ICT, using the internet for frequent communication with people living in their own communities along with other communities and elsewhere in Canada. The women are also familiar with telemedicine, use the internet in a variety of ways to preserve their culture, and identified many strategies for supporting their effective use of ICT. Finally, we explore a case-study of how women in Slate Falls First Nation are using ICT.

Keywords: First Nations, women, information and communication technologies, broadband, remote, rural

1.0 Introduction

First Nations women have strong leadership roles and have traditionally been integral to maintaining connections among family and community members,

contributing to collective health and wellness goals, and ensuring cultural preservation. In many remote and rural First Nations, isolation and geographical distances have at times presented challenges to some of these goals. For instance in many communities, limited access to health and educational services and opportunities means that many First Nations youth and individuals who need certain medical procedures are often required to leave their communities to have access to schools and medical facilities in urban centres.

Until the advent of the internet and broadband technology, maintaining close relationships with friends and family members who have had to leave the communities for these or other reasons have posed challenges. Now, community members can stay connected with each other across distances via video calls, instant text messages, and other means facilitated by broadband. Community members can in many instances also stay in their home communities while receiving health and wellness treatments, and engaging in educational opportunities.

As the information highway, broadband brings faster and more efficient communication tools to remote communities. It is important to document how users of broadband leverage this highway to continue to support their families and communities in a culturally appropriate manner (Whiteduck, 2010). "If designed to meet the needs of First Nations, a digital economy and Aboriginal connectivity can act as a powerful source of jobs and growth and help create stronger First Nations communities" (Whiteduck, Burton, Whiteduck & Beaton, 2010). Access to information and communication technology (ICT) can enable community members to gain a stronger voice in the communities, in their government and at the regional, national and global levels. Nevertheless, we have little information on how First Nation women perceive and use ICT and the internet for personal or community goals (for exceptions see, Luther, 1997; Perley, 2008).

This paper focuses on how First Nations women located in remote and rural First Nation communities in Northwestern Ontario are using information and communication technologies in their daily lives and for personal and community goals such as health and cultural preservation. This study also explores what is needed to support their effective use of ICT.

2.0 Background Literature

2.1 Broadband, KO-KNET and the Remote and Rural First Nations in the Sioux Lookout Zone

Communication technology is essential to people living in remote regions. Researchers in Canada have identified that communication and the technology that supports it enhance community capacity and provide the infrastructure required for remote and rural residents to engage and sustain themselves in the information economy (Romanow & Bruce, 2006). Research from Australia in remote Indigenous communities has highlighted that ICT is changing the lives of residents, bringing both new opportunities and challenges (Taylor, 2012). It has also been noted that research is lacking and there is poor understanding of what "works" to support development in remote Indigenous communities (Carson & Koster, 2012). The present study contributes knowledge about what works, particularly for women, in a remote region of Canada, the Sioux Lookout zone in northwestern Ontario.

The Sioux Lookout zone covers a region as large as France and has approximately 25 remote First Nation communities ranging in population from 60 to 2,000 people.

Each community has an elected government consisting of a Chief and several councillors. Scheduled daily transportation into each of the communities is limited to one to three flights daily on small aircraft. In the winter there is a winter road that community residents can take to travel long distances to regional centres and stock up on goods that are less expensive than or unavailable locally.

Figure 1. Map of First Nation Communities in Northern Ontario

Source. (Nishnawbe Aski Nation, 2012).

Until the 1970's, the remote First Nation communities in Northwestern Ontario had limited access to any communication technologies. They depended on exchanging mail delivered when float planes came to their community. In 1974, Wawatay Native Communications Society was established to provide radio, newspaper and TV communications to remote communities. The communities are presently connected by a managed broadband connection that in many cases they manage in collaboration with Keewaytinook Okimakanak (KO-KNET). Based on the infrastructure available today this connection is limited in these remote First Nations to either a managed single or multiple T1 connection(s) (1.5 MB) or a C-Band satellite connection (2 MB). With the introduction of new IT solutions and fibre networks, these community

connections are slowly being upgraded to 10MB and 100MB circuits.

Today, KO-KNET is the largest First Nation managed network in Canada, connecting over 80 First Nations in Ontario and 30 other First Nation and Inuit communities in Northern Manitoba and Northern Quebec. KO-KNET supports the use of broadband networks for socio-economic development and can be situated within a broader social movement, working toward self-determination for First Nations in Canada. KO-KNET Services takes a community-centered and holistic approach to developing and supporting these locally owned and managed broadband connections (Carpenter, 2010).

All the First Nation communities in the Sioux Lookout zone are connected to KO-KNET's broadband services, and many of the communities have access to KO Telemedicine (health and wellness services delivered via videoconference) and the Keewaytinook Internet High School, among other broadband-enabled services. Two First Nation communities, Fort Severn First Nation and Mishkeegogamang First Nation, have been involved in previous community-based participatory research on how community members are using ICT and their perspectives and concerns on various services (Gibson et al. 2012; Gray-Mckay et al., in press; O'Donnell et al., 2011).

2.2 ICT and Cultural Preservation

First Nation language and culture preservation is a central priority of First Nations communities. Due to residential schools and other policies and factors that have negatively impacted First Nations culture, many people are concerned about the loss of Native languages and traditional and cultural skills including beliefs handed down to raise a family (First Nations Studies Program, 2009).

Many examples exist of how Aboriginal communities in Canada are using ICT for cultural preservation: for example, an Oji-Cree dictionary exists online (Beaton, Fiddler, & Rowlandson, 2004) and a syllabics keyboard was created by KO-KNET, offering the capacity to interact in Cree and Oji-Cree (Fiser, Clement, & Walmark, 2005). Wawatay Native Communications Society also offers its communications online and it is considered to be the leading Aboriginal Broadcasting Organization, connecting listeners to a variety of programs in Native languages.

Our recent study of social media use by First Nation community members in Sioux Lookout zone found that they are frequent users of social media sites. The study strongly suggests that this intense social media activity in the region is contributing to social capital, strengthening both bonding and bridging networks within and among the communities. This activity provides an important avenue for sharing information and stories that support the development of culture and the maintenance of cultural preservation and resilience (Molyneaux et al., 2012). Furthermore, individuals living in Mishkeegogamang First Nation have explored and documented how they use ICT for cultural preservation (e.g., their website features Elders' stories, having community members participate in the Elder Videoconferences). (Gray-McKay et al., in press)

2.3 ICT for Health and Wellness

ICT are being used in many promising ways to support health and wellness initiatives in First Nation communities (for a review, see O'Donnell et al., 2010). One of the most popular ways, especially in First Nations in Northern Ontario, is

telemedicine. Keewaytinook Okimakanak Telemedicine (KOTM) is the only Canadian telehealth network operated and managed by Aboriginal people. It serves 26 First Nations in Northern Ontario (Williams, 2010). KOTM uses a community-centered and holistic approach to its services, as exemplified in their tele-rehab program; they integrate cultural beliefs and practices such as the Seven Teachings into their work. KOTM acknowledges that key to their success and their ability to engage users is First Nations ownership and control of health services, and also how they address cross-cultural challenges of connecting First Nations with western-based medicine (Carpenter & Kakepetum-Schultz, 2010). KOTM uses First Nations practices and methods whenever possible – such as using sharing circles to facilitate a quitting smoking group (Gibson, Coulson, Kakepetum-Schultz, & O'Donnell, 2011a).

For instance, Darlene Panacheese is the community telehealth coordinator of Mishkeegogamang: she works with the community and KO telemedicine to help community members access videoconferencing for their telehealth visits. At one point in her career she leveraged telehealth to assist a local woman with an emergency childbirth delivery, and she used telehealth herself when she was participating in her own pre-natal health education – this spared her from having to take at least a two hour trip to the nearest urban center (Gray-McKay et al., in press).

In collaboration with Mishkeegogamang First Nation and Fort Severn First Nation, our research project completed a study of community perspectives of using telemental health – one application of telemedicine (Gibson et al, 2011b). Community members identified their perceived advantages and challenges of telemental health, along with their concerns about it.

2.4 The Internet and Effective Use of ICT in Daily Life

Several previous studies have been conducted that include an analysis of how women and rural residents in Canada use ICT. For example, working with Statistics Canada general population data, Veenhof, Wellman, Quell, and Hoga (2008) found that all Canadians are actively using the Internet to connect with friends and family, and in particular, people living in rural areas are using it to keep in touch with friends and family who have moved away. Also working with StatsCan data, Middleton & Leith (2007) found that women in Canada use the Internet less intensively than men and do fewer things online. However the questions and survey methods in the Statistics Canada research as well as the population sample are quite different from the current study and so it is impossible to make comparisons between the results of the general research about Canadians and the current study. For methodological and other reasons, studying how women living in remote First Nations are using ICT is very challenging. The authors believe that although the current study is exploratory and based on a small sample, it makes a significant contribution to the literature.

Only a few studies have been published about how remote First Nation community members are using ICT. The authors have worked with the remote First Nations of Fort Severn and Mishkeegogamang to examine how their community members use ICT in their daily lives, and for their jobs. Within Fort Severn First Nation and Mishkeegogamang First Nation, community members are quite active internet users, especially of social networking sites (e.g., using it for work purposes, to advertise community events, etc.) (Gibson et al., 2012; Gray-McKay et al., in press).

In Fort Severn First Nation, authors worked with community members to develop a research paper (Gibson et al., 2012) and a Fort Severn Technology Showcase (http://fortsevern.firstnation.ca/tech_showcase) to trace how the community has used technology for personal and community goals, and for daily use, over several hundred years – dating back to the pre-ICT era and leading up to the current day. Another study explored how Fort Severn community members are using the community-owned cell phone service, Keewaytinook Mobile (O'Donnell et al., 2011).

An important consideration for the current study was the "effective use" of broadband and ICT that can be defined as: "The capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals" (Gurstein, 2003). Having access to broadband and ICT is only the first step in being able to use it effectively. Community informatics theory is focused on developing strategies and applications to use ICTs in support of local economic development, social justice and political empowerment. This includes, among others, ensuring local access to education and health services, enabling local control of information production and distribution, and ensuring the survival of indigenous cultures (Gurstein, 2003).

3.0 Research Questions and Methods

The literature review raises certain themes and issues pertinent to our study of how women living in First Nations communities are using ICT. To explore these, we created and analyzed an online survey to address the following questions:

- How are women living in First Nations in Northwestern Ontario using the internet in their daily lives?
- How do they approach technology use?
- How are they using the internet for cultural preservation?
- What are their perspectives on using ICT for health services?
- What do they need to support more effective use of ICT?

The Kuhkenah Network (KO-KNET) (www.knet.ca) is a First Nations broadband network that has been providing managed broadband services to remote and rural Ontario First Nations for 18 years. This study was designed and conducted as a partnership between KO-KNET and the VideoCom / First Nations Innovation research project (http://videocom.firstnation.ca). In November 2011, invitations were sent to everyone with a knet.ca email account to complete an online survey. KNET had 7,209 email accounts that month, and 4,175 account holders accessed their email and received the invitation to complete the survey. The 663 responses represent a 16% response rate overall, with 568 completing the survey, a 14%, completion rate. Of these participants, 231 women reported living in First Nation communities in Northern Ontario; the study results are based on their responses.

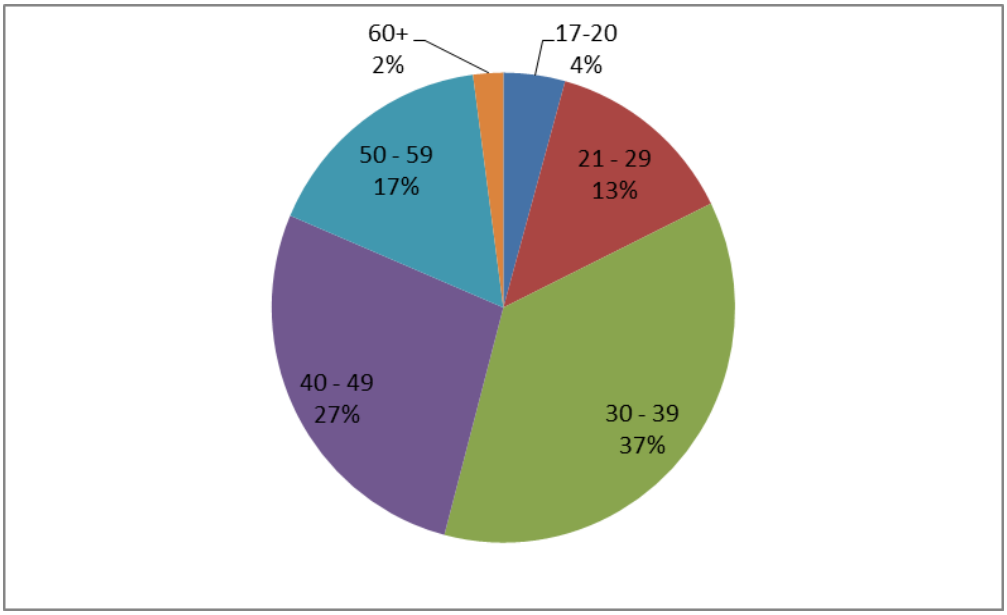
The online survey was created and administered using surveymonkey.com: it included 29 items, a mixture of quantitative and qualitative. Demographic information collected included gender, age category, community that the participant lives in, level of education and role in community. Questions to survey participants covered: their approach to using technologies; their satisfaction and perspectives on the broadband based services that KO-KNET supports (e.g., telemedicine and

education services); what is needed to support their effective ICT use; their frequency of technology use across various ICT; frequency of online activities; how they use ICT to preserve culture; and their social media use within and across communities and elsewhere. The survey data was analyzed using the statistical software program SPSS. Qualitative responses to the open-ended questions were selected to illustrate the themes identified in the analysis.

3.1 Profile of Women in the Study

Two hundred and thirty one women reported living in First Nation communities in Northern Ontario. The women held a variety of roles within their community: many identified as mothers, elders, educators, students, health service providers, and leaders/councillors. In addition, there was a broad age range (17 or younger to over 70 – see Figure 2).

Figure 2. Percent of women in each age category who participated in the study.



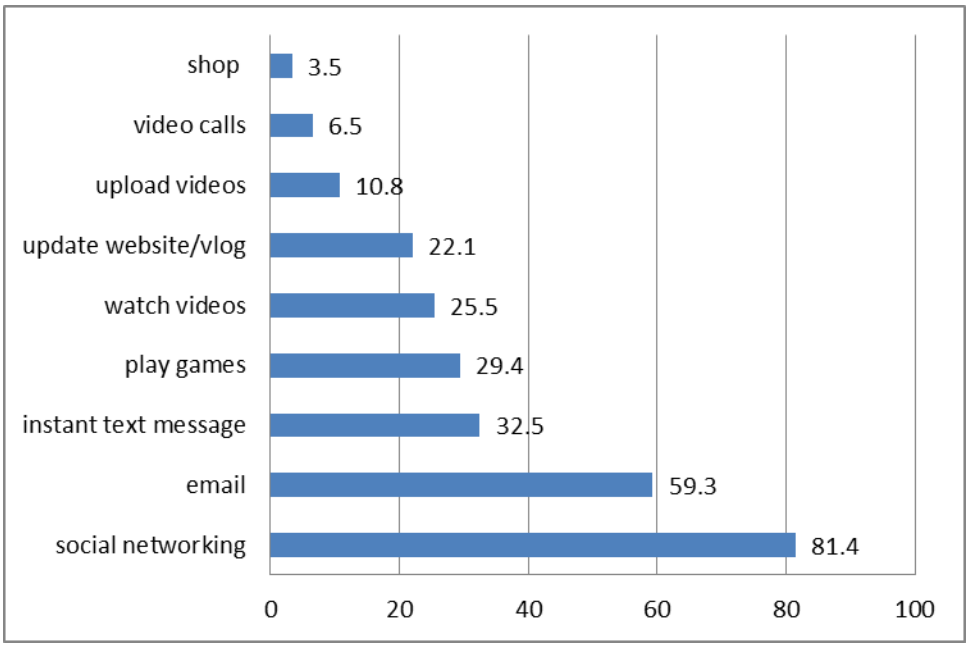
4.0 Study Results

4.1 How are Women Living in First Nations in Northwestern Ontario Using the Internet in their Daily Lives?

Daily Online Activities. Women were asked about their frequency of engaging in a variety of online activities (daily, weekly, monthly, rarely, or never).Using social networking sites was the most popular activity while using the internet for shopping was the least popular. Figure 3 reports on the percentage of women who reported engaging in each online activity on a daily basis.

Women reported high levels of experience with the different activities: all women reported experience using email, and 96.5% reported experience with social networking sites. Ninety percent of women had watched videos online, and 82.7% have updated a website (e.g., KNET homepage or Facebook page) or a video blog. Finally, 72.3% have uploaded a video online, 65.4% have shopped online, and 61% have made a video call.

Figure 3. Percentage of women report engaging in various online activities on a daily basis.



Age and Online Activities. Level of engagement with the above online activities varies somewhat across the different age categories. Although it is outside the scope of this paper to analyze activities across the different age groups, certain trends were observed while exploring the data. Younger participants appear to be more frequent viewers of online video. Furthermore, there also appears to be a trend whereby younger users reported engaging in more video calls, uploading more videos, and using the internet for shopping activities. However, what was perhaps most interesting was the fairly moderate to high level of engagement with technologies across the ages.

Social Networking. Of all the online activities that women were asked about, they reported engaging with social media sites the most frequently. Who are the women communicating with? We asked them about their frequency of using social networking sites to communicate with people living in: their own community, other communities in Northwestern Ontario, elsewhere in Ontario, elsewhere in Canada, and other countries.

Most women reported communicating with people in their own community on a daily basis (70.6%): 17.3% communicate with these individuals on a weekly basis. Only 3% are communicating with people in their own community on a monthly basis, 7.4% reported rarely, and 1.7% reported that they never communicate with people living in their same community.

Once again a near majority (58.4%) reported communicating with people living in different communities in Northwestern Ontario on a daily basis: 18.2% reported doing so on a weekly basis. Another 10% reported a monthly frequency, while 10.4% indicted rarely, and 3% reported never.

Almost half (49.8%) of the women reported using social networking every day to link with people living elsewhere in Northwestern Ontario. More than one third of the women communicate daily using social networking with people elsewhere in

Canada but far fewer (14.7%) use it for communicating with people in other countries.

4.2 How are the Women Approaching Technology Use?

Most of the women reported using technology wisely and with consideration: when asked "how quickly do you respond to new technology?" only 3.9% indicated that they purchase the latest technology as soon as it is available. By contrast, the majority (76.2%) reported: "I take my time to consider the usefulness of the product before I buy it." In addition, 19.9% of the women indicated: "I only buy products once they have become standardized and there is no other option." Furthermore, the majority of the women did not indicate a dependence on technology. When asked: "what role does technology play in your life?" 65.8% reported that: "it helps" while another 9.1% indicated that they "could live without it." Lastly, 25.1% noted that they "couldn't live without it."

*4.3 How are the Women Using the Internet for Cultural Preservation***?**

Women reported using a variety of online methods to preserve their culture – the most popular method (reported by 64.9% of the women) was using the internet to post photos, news, or stories online to share with others. Next, 58.4% reported going online to listen to music or look at art made by Aboriginal people and 48.5% reported using the internet to read stories or books online that are written by Aboriginal authors. Another 25.1% reported using the internet to post announcements and raise awareness about pow-wows or other cultural events, while 20.8% reported writing a story and sharing it with others online. Finally, only 12.1% of the women reported that they do not preserve their culture in anyway. One woman clarified this in a qualitative response:

> *"I go hunting and fishing. Go out on the land. I go with my children and show them physically. I don't post things online."*

Some women elaborated on how they were using the internet for cultural preservation, including this survey response:

> *"Sharing our lives in remaining connected with relatives, and sharing our traditional land-based knowledge."*

The following woman explains how she goes on the KNET website (knet.ca) to explore the photo archives of community events: she also uses the MyKnet.Org homepage service (available to anyone with a KNET email address) to connect with others, read stories, and stay updated on community events and situations:

> *"I am located in Southern Ontario attending school and the only means of staying connected to my home community is visiting KNET archives and viewing the photos of community events, feasts, elders, etc. Homepages are also a great place to stay connected through the stories and emergency community events. e.g. illness, etc."*

Another woman enjoys using her KNET homepage to communicate in her Native language, thanks to the syllabic fonts that they make available:

> *"This using my own language on my KNET homepage...which is good that they have that syllabics fonts on there!"*

Additionally, one woman indicated that she uses the internet to listen to "*Wawatay radio" (http://www.wawataynews.ca/radio):* Wawatay is an Aboriginal broadcasting service that reaches listeners via community radio and broadcasts in Native languages in addition to English.

One woman explains how she uses a pow-wow website to inform herself of local events,

> *"I'm a member of pow wow. com. I use the website craft section and pow wow announcements for our area."*

4.4 What are Women's Perspectives on Using ICT for Health Services?

Telemedicine involves using videoconferencing and other ICT to connect individuals with health professionals of all kinds (e.g., physicians, mental health professionals, etc.), to communicate education on health-related matters, and support health-related groups (e.g., quitting smoking, etc.). The majority of women (83%) indicated that they had "heard of telemedicine." However, less than half of them (41.5%) had used telemedicine in the past. In terms of intention to use telemedicine, women were largely undecided: 56.1% indicated: "I don't know" when responding to the item "I intend to use telemedicine in the next year." However, 25.7% indicated that they do plan to use it in the next year (18.3% reported that they do not).

More than half (56.3%) of the women indicated that: "telemedicine would be a useful service for me," while 9.2% disagreed with this statement, and another 34.5% were undecided and endorsed "I don't know." When asked if telemedicine services should be increased in their community, 57.6% of the women agreed, 5.6% disagreed, and 36.8% responded: "I don't know."

When asked if telemedicine can be a good alternative to visiting the health professional in-person: 66.8% of the women indicated yes, 6.1% disagreed, and 27.1% were undecided. Women were also asked about any privacy concerns, and 49.1% reported that they would have concerns about the privacy of a telemedicine session (27.4% indicated no concern, and 23.5% reported "I don't know.")

It is important to point out that the KO Telemedicine service is available in 26 First Nations but the current study included women living in many other First Nations in the region where the services are unavailable; therefore, the responses, especially the "I don't know" should be understood in this context.

4.5 What do the Women Need to Support More Effective use of ICT?

Women identified what their needs were in terms of supporting their effective use of ICT. In descending order, 81% of women indicated that "better or faster internet" was a high priority. One woman wrote:

> *"When you depend on technology in order to provide services for the community and the internet is always down then it is frustrating. Right now I am doing this survey on my emergency dial up because the Internet is up and*

> *down every 5 minutes. If not that it is so slow it boots you off because it takes too long to turn pages. Same for ordering or doing banking...."*

Next, 48.9% reported that they required "a computer or a better computer" and 44.2% identified "a community cell network or better range on a cell network" as a need.

> *"I'm in Sandy [Sandy Lake First Nation]...upset because we don't have cell phones here yet."*

The Keewaytinook Mobile (KM) cellular service is expanding in all the communities in the region (see O'Donnell et al., 2011). In 2013 many of the community-owned cellular services will be expanded from 2G to 3G which will allow users to access the internet on their cell phones. A "mobile phone that can access the internet" was identified as a need by 40.7% of women, as illustrated by this comment:

> *"Would be great if we could access the internet using a cell phone. Would also be awesome if there was free wireless hot spots for all to use in the community."*

> *"Money to pay for internet connections" was reported by 32.9%. The quote below is from a woman who asked for lower costs - not for her internet connection but rather for cell phones:*

> *"The mobile phones minutes cost too much per minute and paying for texting at the same time. Most of the people are on welfare, how can we pay for all these things internet, minutes of the phone, cable, phone and don't get me started on the northern! Make the prices cheaper or give us what we paid for. internet in the city cost the same or cheaper and have way better speed ."*

Other women had a more positive view of the costs of the cell service in her community:

> *"I enjoy the fact that I can text my family in the community for free on a daily basis, saves me $$ on the phone bill." and "I like this network. I am able to communicate with my relatives in Fort Severn with texting and am pleased with this service. Thank you for making it possible."*

Finally, only 9.5% of women reported that they did not require anything else to support their effective use of ICT – "Nothing, I have everything I need."

Some women had other specific ideas of what they would need to support their effective use of ICT, including some requests for equipment:

> *"To have our own teleconference unit in the school"* and *"More access to [ICT] products at fair prices."*

Several women reported that they would like to see training on ICT offered, and a couple of women noted how it would be helpful to have a local community person do this training and also be able to offer support and technical assistance:

> "*Major training for all in use of technology, including elders. More on-site technical support, instead of long waits for assistance*."

One woman noted that she has access to certain equipment but would like to obtain training on how to use it:

> *"We have smart boards at our school and it would be awesome if there was training on how to use smart boards."*

Other women spoke of the need to have education and awareness around using ICT respectfully:

> *"I have a daughter who is 8 now.... when she was just a baby, someone made a KNET homepage under her name and it even said she was from Fort Severn... recently someone also made a Facebook account using her name.... I'm only mentioning it because it most likely used a KNET account.... I think there need to be workshops done in communities that target the youth, to make them understand that it's not right to impersonate people by making bogus email accounts and bogus social network accounts.... I see some cyber bullying too; it's not too bad but why not trample on it before it gets worse?"*

5.0 Video snapshot: Women and ICT in Slate Falls First Nation

The Northwestern Ontario Broadband Expansion Initiative to construct a Bell Aliant fiber network is supporting 26 First Nation communities to upgrade their connectivity infrastructure with a fibre optic cable connection. Several of these First Nations including Slate Falls are members of the Northern Indigenous Community Satellite Initiative managed by Keewaytinook Okimakanak. Switching to fibre allows broadband connectivity speeds up to 50 times faster than satellite.

Slate Falls First Nation, a remote Oji-Cree community, is the first community in this construction project to switch from satellite to fibre. The Slate Falls Chief and band council are all women, as are many of the community members who lead and manage the community services using the local broadband services. These community leaders made their decision to continue supporting the local services, including the local IP phone service on their cable network instead of allowing Bell Aliant to offer their phone service throughout the community. As part of the KO e-Community work, KO-KNET is working with these leaders and service managers in Slate Falls First Nation to support their local network. All the local

equipment and services including the internet, videoconferencing, IP phones, telemedicine, and so on are owned, controlled and accessed by the Slate Falls community.

On November 20th 2012, multimedia coordinator Cal Kenny from the Keewaytinook Okimakanak tribal council, or KO (www.knet.ca), and KO research partner Susan O'Donnell from the First Nations Innovation research project (http://fn-innovation.pn.com) and the University of New Brunswick flew to Slate Falls First Nation to talk with community leaders about their new fibre connection. The fibre will support Slate Falls First Nation to use broadband strategically for future community and economic development. Cal Kenny produced a video about the visit that is available on the KO and research project websites (http://media.knet.ca/node/22175; see http://media.knet.ca/node/22176 for a video on E-Community work in North Spirit Lake).

In the video, several Slate Falls First Nation women leaders and managers talk about the importance of connectivity for their community and how they are using ICT to deliver and operate essential community services. Band Councillor Cecelia Spence uses ICT daily for many band governance and administrative functions and to keep in touch with community members and their needs. Elsie Sakakesic (Band Administrator) talks about how connectivity and internet services are essential for band administration and that owning and operating their own IP phone service is providing both autonomy and revenue that provides local employment. Ruby Bighead (Health Director) says that reliable connectivity is essential for telehealth services and health administration and adds that it is the community youth who are teaching many of the older community members how to use ICT effectively. Bertha Basketawang (Education Director) has worked with the school principal to upgrade the computer lab, implement computer-based learning programs in the classrooms and develop several initiatives to introduce students to the newest technologies available to them.

The dedication of these women leaders in Slate Falls First Nation to ensuring the effective use of technology in their community is an excellent example of how women in First Nation communities are leading and supporting broadband and ICT developments in the region. There are many other examples from other First Nations in Northwestern Ontario where women are playing a leading role in community use of broadband networks and ICT.

6.0 Discussion and Conclusions

Women living in First Nations in Northern Ontario who responded to this survey are active users of ICT, who appear to have integrated the use of ICT into their daily lives in order to reach their personal goals (e.g., communication with family, accessing health services) and community goals (e.g., preserving their culture). First Nations women living in remote and rural communities have not been left behind but have embraced technology to strengthen their responsibility in nurturing their family and community. They email, text, post pictures, and update social networking sites to ensure their families are informed and taken care of. First Nations women see not only the dangers for children and the use of ICT but also the benefits of using ICT to bring needed services to their communities.

As First Nation women continue to hold onto their cultural background they also take the leap forward and incorporate new ICT applications and services in their

everyday lives. The impression someone might get is that when you live in a remote community you are limited in the way you might utilize broadband. Indeed, the issue of the digital divide has been raised and people have raised the concern that First Nations communities might not be in a position to make as effective use of ICT as others due to many challenges, including marginalization (Bredin, 2001). At the same time, at least in the past, women have also been seen as the "underdog" within the context of the digital divide. Within our study at least, it is evident that women in rural and remote communities in Northern Ontario have been energized to take ownership in the way broadband and ICT applications are used to complement the way they raise their families, support their communities and tell their stories. Outside of our study, we can see how First Nations and First Nations women in particular are using ICT (e.g., Facebook) for advocacy and social justice purposes: the Idle No More movement is a prime example of this.

Women are using the internet enthusiastically in their daily lives, communicating with people in their First Nations and other First Nations on a regular basis via the internet, and are using it to help preserve their culture in meaningful ways. Many women are also using broadband-based health services, are interested in how this service can be useful to their community, and are thinking critically about it (e.g., in terms of privacy). Further, women were very adept at stepping forward and identifying what they needed to support continued effective use of ICT: as researchers it was exciting to see all of the qualitative information that the women volunteered in terms of identifying specific resources that could help them with ICT use in their daily lives and communities – many women also took the time to clarify their quantitative responses, providing very useful information that community members and others (e.g., KO-KNET) working in the area of ICT can use to support the effective use of ICT in their communities.

The survey results clearly identified a need for greater awareness about telemedicine with so many undecided responses to the statements about the effective use of these tools. As mentioned earlier, KO telemedicine services presently exists in 26 remote First Nations but the survey data is drawn from all KNET email account holders which represents a much wider First Nation audience. Including women in the study where telemedicine services are unavailable does influence some of the results and does help to explain the high level of undecided responses. Our analysis suggests that the finding that 36.8% of the survey respondents are undecided that telemedicine services should be increased indicates a need for both the expansion of the service to all First Nations and for more awareness about the telemedicine services available. Similarly, 34.5% were undecided about the statement that "telemedicine would be a useful service for me." Creating a public awareness campaign, hosting open workshops about telemedicine, travelling to the First Nations to meet with leaders and community members, lobbying government for the expansion of the telemedicine into all the First Nations in the region are a few of the strategies being implemented by the KOTM team and require additional attention.

More information about how women in remote First Nations in the region view telemedicine can be found in the study, "Conversations on telemental health: listening to remote and rural First Nations communities" (Gibson et al., 2011b). That study concluded that many participants saw telemental health as being potentially very useful for their community. That study also explored the reasons why some community members were hesitant about using the technology – many participants in the study questioned the appropriateness of delivery mental health services over

video, instead of "in person." For example, one woman interviewed questioned the real benefit of using telemental health when some individuals in the community do not have the basic necessities of daily living (e.g. running water). Since 2002, in the communities where the KO Telemedicine services are available, the engagement and planning of community telemedicine is the role of not only the local telemedicine worker but also many key telemedicine champions. In 2012, Chief Rita Thompson of North Spirit Lake First Nation and Chief Connie Gray-Mckay of Mishkeegogamang First Nation spoke at the Nation eHealth Conference highlighting the importance of having ehealth services including telemedicine for their communities.

Despite the vigorous use of ICT, the demand for better broadband and reasonably priced broadband was clearly identified: this would allow First Nation women users to operate at the same level as someone in a town or city. For instance, when we explored how frequently women are using the internet for various activities we see that more than a third of women have never made a video call – this could be because they are not interested, or, it could be due to the bandwidth issues (one woman commented on how she cannot even do her online banking due to bandwidth issues, and she was even completing the survey on her emergency dial-up). Better broadband, easier access to it, along with support and training as needed, might enable more women to use the internet in more effective and meaningful ways: women could attend their online classes without as many interruptions to their learning, they could create and share more videos on significant issues. This broad need for community capacity to use broadband is reflected in our recommendation to support the community to meet this need for all its community members.

KO-KNET has been working steadily, since its formation 18 years ago, to work with the First Nations in the region to build community capacity to effectively use broadband and ICT applications. Remote and rural First Nation women are key users of ICT applications. They are teachers delivering classes, health promoters supporting health delivery, and mothers staying in contact with families.

Supporting on-going community capacity building in using ICT and the internet will be necessary in order to facilitate effective ICT use: women identified several strategies that could be helpful at the community level, including having training and workshops for people across all age groups on various topics, including the respectful use of ICT, as well as having more community members trained on how to provide technical support. It would be beneficial for people working in the area of ICT in First Nations communities to be mindful of all of the needs and ideas that were identified by the women, and to work with community members and leadership to address these concerns.

This study could lead to documenting important policy changes to develop programming for First Nation women around ICT capacity building or better community networks and the need to establish them in a way that will be sustainable in the long term. Our related research has also explored the need for community ownership and control of its local network as a way to generate local income that could be used to sustain the network in the long term. This approach, called the "First Mile" continues to be explored and has to date generated several publications: (McMahon, O'Donnell, Smith, Woodman Simmonds, & Walmark, 2010; McMahon et al., 2011) and has resulted in the creation of many community stories of how First Nations are using technology locally (http://firstmile.ca).

This current study has several limitations that should be highlighted. First, all the respondents were KO-KNET email account users and thus were already internet users, so the data does not include responses from women who are not online. The study participants were self-selecting and there were a limited number of respondents to the online survey. At the same time, we believe that due to the remoteness of the communities and the challenges of conducting research in these communities, the online survey approach was by far the most feasible way to conduct this survey, and the data it generated is very likely to be the most comprehensive data available on this topic in the foreseeable future. (For a more comprehensive discussion of the challenges of conducting research with these communities, see Gratton & O'Donnell, 2011). Finally, since this study did not use a random sample and was not designed for this purpose, generalizations (e.g., to all women living in First Nations in Northern Ontario) should not be made.

There is an abundance of possibilities for future research: this study was a starting point and exploratory in nature. It would be helpful for community members and researchers working in the area, especially those in First Nation communities, to continue to identify and promote good practices and lessons learned on the ways that First Nations women are using ICT. Communities will need to have the capacity to conduct research on technology use by community members, and to effectively analyze the data generated by community research. This implies several things, including engagement with the principals of OCAP (Schnarch, 2004), a long-term focus on university education and collaboration with researchers willing to conduct community-based participatory research that also builds community research capacity.

In conclusion, this research sheds light on an under-studied group – the challenges of engaging First Nations women living in remote communities in research are real and deserve notice. Given the exploratory nature of the current study, the authors encourage others to continue this work to develop our understanding of the ICT practices of these women living in remote and isolated communities and give us a deeper sense of the meanings of the ICT or non-ICT uses in these women's lives.

In striving to support the effective use of ICT for personal and community goals, it could be helpful for communities and researchers to continue to showcase how First Nations women are using technology to meet personal, health, educational, cultural, and community goals. Continuing to develop research projects and policies that address gender equity and gender issues in ICT jobs, education and application development will help further our understanding of what is needed for the effective use of ICT by First Nations women and will help us all continue to work toward that goal.

7.0 Acknowledgements

We would like to warmly thank all of the women who took the time to complete the KO-KNET 2011 survey, especially those who made the effort (as many did) to share their thoughts and comments with us. We would also like to thank the KO-KNET staff who greatly assisted in creating this paper and in constructing the original survey. We would also like to thank the First Nations Innovation team for assisting with various aspects of this study. The First Nations Innovation research has been funded since 2006 by the Social Sciences and Humanities Research Council of Canada and in-kind contributions from the project partners - Keewaytinook

Okimakanak, the First Nations Education Council and Atlantic Canada's First Nation Help Desk / Mi'kmaw Kina'matnewey (http://fn-innovation.pn.com).

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