Supporting Indigenous Language and Cultural Resurgence with Digital Technologies

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Cover photograph: UNB Elder-in-Residence Imelda Perley sharing cultural knowledge with the developers of the Mi'kmaq Wolastoqey Centre Language App.

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Source: Joshua Fishman, Reversing Language Shift, 1996.

1 Executive summary

This report synthesizes knowledge about how digital technologies are supporting Indigenous language and cultural resurgence. The use of digital technologies supporting the transfer, preservation, sharing and protection of Indigenous languages and culture is evident in many innovative, exciting initiatives around the world. We focus in particular on knowledge, approaches and examples from Wabanaki territory where the authors are based. The report introduction begins by recognizing and honouring the unceded traditional territories of Wolastoqiyik within the Wabanaki Confederation as the place for the creation of this report as an essential initial step in positioning our work.

The report starts with a poem that illustrates many reasons why Indigenous languages are important to Indigenous people and communities. Next are the five key messages from our knowledge synthesis developed by the team: using a "whole community" approach; a community or nation should own its digital language resources; Indigenous people should control the technology as well as the language resources; the knowledge of Elders should guide the development of technology resources; and policies for digital resources for Indigenous languages should be guided by the UN Declaration on the Rights of Indigenous Peoples and the report of the Truth and Reconciliation Commission.

Each of the key messages includes recommendations for moving forward. These include recommendations for: Indigenous individuals, Indigenous families, Indigenous communities, Indigenous schools, universities and other educational institutions, other Indigenous organizations and institutions, governments, and developers of Indigenous language apps and online language resources.

The report introduction situates this work in Wabanaki territory and introduces the context and background. Sacred and traditional knowledge, including Indigenous language and culture, is shared and passed along by the Elders in ceremonies and gatherings across the region. The information shared within this report is intended to be used by allies willing to do the work to protect and pass on this knowledge in a respectful manner, always recognizing and honouring those who shared their gifts.

Next is a description of the Indigenous methodology that we used to develop this report. This section describes the holistic, continuous, participatory, action research approach being undertaken in the development of resources at the University of New Brunswick. This research method was shared by the principal investigator of this Knowledge Synthesis project at the Canadian Sociological Association conference at the Congress of Humanities and Social Sciences at the University of Calgary in June, 2016 (Perley, 2016). The research method provides a detailed description of a respectful approach to gathering and working with Indigenous traditional knowledge shared by Elders and community members.

The next section of the report is a brief overview of Indigenous communities and digital technologies. This section draws from a comprehensive report and paper also presented in June 2016 at the Congress (see O'Donnell et al., 2016 in the References section for the link).

The information includes discussion of the "First Mile" approach to digital technology infrastructure development. The First Mile approach supports the local planning, construction, ownership, maintenance and control of broadband infrastructure and internet services inside communities; empowerment of members of these communities to build, operate and manage resources such as digital infrastructures and services in ways that best meet their locally-determined needs and aspirations.

The report then turns to a discussion of Indigenous resurgence, starting with Fourth World theory (Manuel & Posluns, 1974) that includes a vision of the future wherein Indigenous societies, have overcome the intergenerational trauma of settler colonialism, have harnessed modern technology within their respective cultural and linguistic frameworks to recover and revitalize their languages, cultural worldviews, and ways of living. Technologies are understood to be decolonizing tools of Indigenous resurgence. The following chapter provides an overview of the work being undertaken by Indigenous language revitalization programs and provides further background about the urgency and importance of this work.

The chapter on technologies for Indigenous language and cultural revitalization describes how online tools and digital technologies have empowered Indigenous peoples with life-long learning opportunities that have practical applications in their daily lives. For Indigenous learners and communities who are geographically separated by provincial borders within their territory, digital technology allows for instant communication in which learners and speakers interact in real time leading to greater local resiliency.

Next is a chapter with examples of projects for Indigenous language and cultural revitalization taking place in Wabanaki territory and Canada's Atlantic region. Language and cultural initiatives are being developed and led by individuals, communities, organizations and academic institutions. Each project delivers another opportunity to ensure local and regional Indigenous languages and cultural teachings are available for future generations.

The section on online resources for Indigenous language revitalization is a first-person account by a young Indigenous student on the project team, reviewing some of her favourite online Indigenous language resources. They include the Four Directions Teachings website, Red Works photography and Blue Earth photography.

Following that is a brief snapshot of a language app project developed at the University of New Brunswick in the summer of 2016. The process describes the importance of grounding language app development the cultural context of the language. The project was guided by Ogoki Learning Systems, a software development company specializing in software applications (apps) for learning Indigenous languages.

The report includes two appendices: an annotated bibliography and a list of online Indigenous language resources. It is the authors' hope that readers will add to these resources and begin their own library of Indigenous language digital resources.

2 Key messages and recommendations

Our project has developed five key messages for supporting Indigenous language and cultural resurgence with digital technologies. They are outlined here, followed by their associated recommendations.

Key message #1: A "whole community" approach is required
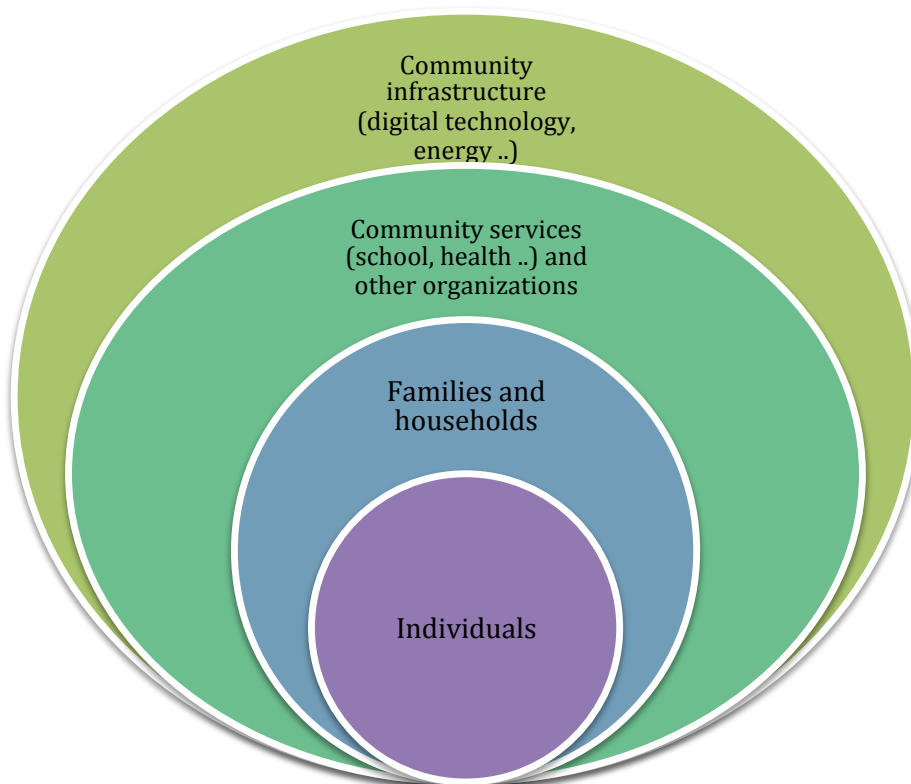
A holistic approach to digital technology can support Indigenous language and cultural resurgence. As illustrated in the diagram below, the core is the individual who makes the decision to communicate in an Indigenous language. Digital tools such as apps are available for individuals to support their decision.

Surrounding the individual is the family and household. Digital tools are available for families to share

(Diagram labels: Community infrastructure (digital technology, energy ..); Community services (school, health ..) and other organizations; Families and households; Individuals)

content such as films, videos and music in Indigenous languages.

Community schools are an important element in language revitalization however staff working in other community services and organizations - health centres, band offices, policing services and others - can also commit to using Indigenous languages, using digital support tools.

Finally, the digital infrastructure in communities can include community technicians who speak Indigenous languages, and the digital tools and applications can include instructions and interfaces in Indigenous languages.

Recommendations for Indigenous individuals and families

Do the work to learn the language. Ultimately, the decision to learn or re-learn an Indigenous language comes down to interest and hard work by Indigenous individuals and families. Digital technologies can assist individual and family efforts however the technologies are only a tool. As discussed throughout this report, there are many resources available that can assist language learners. As long as individuals and families can control how they spend their time, they can choose to spent some of their time learning a language using digital technologies. Canadians generally spend many hours in front of a screen. Language learners can choose to spend a portion of their "screen time" with the many applications and online resources available to learn Indigenous languages. Ultimately it will be up to individual choice to do the work required to learn a language. Making the decision to do it is perhaps the hardest work of all.

Recommendations for Indigenous communities and community organizations

It takes a whole community to support language revitalization. Indigenous language learning needs support and action on many levels within the community. Revitalization of Indigenous languages will be a challenge for the community members and households more comfortable in Canada's two official languages. As discussed in this report, the internet and associated technologies may contribute to the disappearance of Indigenous languages even as the communities strive to preserve them. Efforts to develop Indigenous language applications and content need to be supported by the whole community.

Make Indigenous language revitalization a priority. The literature highlights the importance of providing community members with access to localized online resources catered to community-specific needs to help maintain Indigenous control over their knowledge, language, and culture. Indigenous communities will need to make Indigenous language revitalization a priority, to pressure governments to provide adequate funding for revival activities.

Indigenous organizations and institutions can reward and support staff members who speak Indigenous languages at work. Rewards could include financial incentives, similar to the "bilingual bonus" given to public servants who can speak both official languages. Indigenous language apps could be available on the organization network or installed on every workstation computer. Specific times could be set aside in the workplace to use the apps and engage with Indigenous language content in small groups.

Share the resources. Indigenous community organizations and households with language resources could assist Indigenous community members in developing and implementing language and cultural revival models. They may have technical, human and financial resources that other Indigenous community members are lacking. Human resources may include technicians who will provide training in digital technology or establish a community-based infrastructure that allows digital technology to grow within the community.

Recommendations for Indigenous community educators

Schools should use a comprehensive approach to language revitalization that integrates digital resources in all aspects of the strategic plan. Indigenous schools have adopted various models of language and cultural revitalization initiatives. Some models are limited in their approach to revitalization while others are comprehensive. Successful models include a language policy, strategic action plan, adequate funding, Elder's participation, development of language learning resources, and recognizing the benefits of incorporating digital technology for revitalization and community outreach using websites, language apps, facebook, youtube, instagram and twitter. Indigenous schools should adopt a comprehensive approach to language and cultural revitalization within their schools and establish a virtual link to community members. This approach ensures that all teachers and staff of the school are responsible for the implementation of their language policy and strategic plan. In most cases where schools have a limited approach to revitalization, the responsibility for language and cultural revitalization within the school is solely in the hands of the language and culture teacher.

Key message #2: A community or nation should own and control its digital language resources

Archives and online collections should be owned by a community or nation, avoiding a national archive. Speakers of every Indigenous language should have an equal opportunity to access digital resources to support their efforts. National-level collections risk privileging the largest groups of language speakers, marginalizing the Indigenous languages with only a few speakers that are often the most endangered.

Recommendations for Indigenous communities

Record community language speakers and take care of the archives. Verna Kirkness (1998) a pioneer in Indigenous language education in Canada, believes that this is the most important priority for revitalizing Indigenous languages. Many digital recording devices are now available and affordable, on smart phones and computers. Open access digital recording software such as Audacity is freely available and easy to use. Almost anyone with these digital devices can use them to record the stories of the Indigenous language speakers in the communities. The archives of these recordings are a precious resource that will help support language learners now and into the future.

Recommendations for governments

Increase the funding available to communities for Indigenous language programs. Digital technology has the advantage of being in widespread use and so much more affordable than in previous decades. Making a digital audio or video recording is possible for almost everyone who has a mobile phone. The equipment and software required to produce and edit digital content and applications are in available in many homes, schools and communities. What is missing, however, are financial resources to support the

required work. It is discouraging for Indigenous language activists how little support is available to support their work, in comparison with supports for other cultural activities. In the most recent federal budget for example, the amount allocated to Indigenous language programs was five million dollars, a fraction of the cost of the annual Canada Day celebrations. Governments who value Indigenous culture will provide adequate and appropriate funding for Indigenous language initiatives in communities, including for digital technologies to support and share the teachings and resources. It is important that the funds be directed to the communities for the development of digital language and cultural programming, so they can hire local people to do the work and thus retain the skills within the communities.

Use Indigenous languages on government websites. This will validate and encourage the use of Indigenous languages by people using the services.

Key message #3: Indigenous people should control the technology as well as the Indigenous language resources.

Similar to the concept of "Indigenous control of Indigenous education," technology can be developed using a "First Mile" approach in which communities control how the technology is developed in their communities to meet community needs. The First Mile approach is in contrast to the "last mile" perspective used by telecommunications companies to describe communities and households as the last to be served by telecommunications infrastructure built outwards from urban centres.

Recommendations for governments

Support approaches for developing digital infrastructure in northern and remote regions that ensure equity, adaptability, accessibility, affordability and sustainability. The lack of accessible and affordable digital infrastructure is the major barrier to more effective use of digital technologies in remote and northern Indigenous communities. The price of connectivity in northern and remote communities is high, particularly considering the charges for exceeding data caps, which are highest in satellite-served communities. The costs of adopting digital technologies will continue to be a constraint or a barrier to technology adoption as long as services are not affordable for fixed income residents and those dependent on subsistence activities and seasonal employment. The goal should be for all communities to have equitable access to fibre infrastructure and to own and control their own local digital infrastructure.

Recognize the need for training, skills development and capacity-building at all levels in the community, including for community technicians. Many programs designed to support digital technology adoption in Indigenous communities underemphasize the importance of training, skills development and capacity-building within the community. This is a key factor determining whether or not the potential of digital technologies in Indigenous communities will be realized. We recommend an approach that focuses on training youth and Elders to be technical and digital leaders in

their communities. Such an approach involves program staff partnering with communities to facilitate the resources and capacities that will produce community technical resources appropriate for regional as well as linguistic and cultural contexts.

Recommendations for Indigenous communities

Ensure every Indigenous community has local technical support available. Indigenous communities require a local technical team to provide ongoing support for the communications infrastructure, rather than relying on distant telecommunications providers. Currently these resources are very challenging to find or retain for many Indigenous communities.

As much as possible, use a "First Mile" approach to developing digital infrastructure in the community. There are many examples on the First Mile website (http://firstmile.ca) of of Indigenous owned and managed digital technologies applications and networks that can serve as role models and examples of how digital technology challenges are being addressed by Indigenous communities. This approach aims to empower community members to build, operate and manage digital infrastructures and services in ways that best meet their locally-determined needs and aspirations.

Key message #4: The knowledge of Elders should guide the development of digital language resources

All digital technology developments should start with sharing information and ideas from Elders, including the role of Elders and the role of ceremonies in the process.

Recommendations for developers of Indigenous language apps and resources

Begin with an Indigenous worldview. Respect the diversity among Indigenous nations and value the unique cultures. Work with the Elders, the people who have the ceremonies. Ask them to validate the materials, and any project to do with language and culture.

Recommendations for universities and other educational institutions

Universities and other educational institutions should also have a comprehensive approach that includes engagement with Elders and communities. As with Indigenous schools, universities and other post-secondary institutions have developed and implemented a range of revitalization initiatives. Some universities offer language classes only and others have developed and implemented a wide range of language revitalization activities. For those post-secondary institutions that are implementing a wide range of revitalization activities, the first step was establishing a strong link with Indigenous communities by inviting Elders and community language warriors to the participate in the development and implementation of language and culture revival activities. In this way, the "language community" is expanded to include both First Nation communities and post-secondary institutions. The team consisting of First Nation and university representatives

work together to develop language policy, strategies for revival, recruiting a language coordinator and development of written (e.g. books, workbooks) and digital resources (e.g. websites, language portals, online dictionaries, apps, facebook). In addition to class-based language classes, post-secondary institutions also develop virtual classrooms through videoconferencing and other web-based visual communication media such as skype. It is also important for universities to offer teacher training (bilingual and immersion class) and conduct language related research that will benefit Indigenous communities and universities that are partnering with Indigenous communities.

Key message #5: Policies for digital language resources should be guided by the UNDRIP and the TRC Calls for Action

Recommendations for governments

Both the United Nations Declaration on the Rights of Indigenous Peoples (2007) and the report of the Truth and Reconciliation Commission (2015) include guidance for supporting Indigenous language revitalization. For example, the Truth and Reconciliation Commission's (TRC) Call to Action 14 states:
We call upon the federal government to enact an Aboriginal Languages Act that incorporates the following principles:
I.   *Aboriginal languages are a fundamental and valued element of Canadian culture and society, and there is an urgency to preserve them.*
II. *Aboriginal language rights are reinforced by the Treaties.*
III. *The federal government has a responsibility to provide sufficient funds for Aboriginal-language revitalization and preservation.*
IV. *The preservation, revitalization, and strengthening of Aboriginal languages and cultures are best managed by Aboriginal people and communities.*
V.   *Funding for Aboriginal language initiatives must reflect the diversity of Aboriginal languages.*

3 Introduction

Recognizing and honouring the unceded traditional territories of Wolastoqiyik within the Wabanaki Confederation as the place for the creation of this report is an essential initial step in positioning our work. The Mi'Kmaq-Wolastoqey Centre (MWC) at the University of New Brunswick (UNB) offers our sincere thanks to Wolastoqiyik. We recognize their lands and resources they are sharing with us that make it possible to do our work at MWC. The majestic view of Wolastoq (the Saint John River) from most of the buildings on the UNB campus reminds each of us of the sacrifices made by the original peoples of this land so we can now benefit from the privilege of working to produce this report.

The report authors feel energized sharing the strength and extent of the work being done across the region, the country and internationally to ensure local Indigenous languages and cultural practices are protected and sustained. The innovative use of digital technologies is widespread across different Indigenous nations. Indigenous people are using these communication tools to share and preserve their languages and culture for future generations; to support the resurgence, use and integration into their schools and communities; to create and use online digital language learning resources; and to protect, sustain and revive the traditional knowledge and teachings contained in these Indigenous languages and ceremonies.

Elders are encouraging and supporting the development of digital resources that can be used by young people to ensure their languages and teachings are available for future generations. People are travelling and conducting research online to learn the traditional knowledge available in communities of the different nations. They are sharing together; finding new allies, teachers and teachings; helping each other create strategies and hope for a strong and healthy future for the next generations coming.

Every Indigenous nation has its own history of colonial interaction involving struggles and oppression. In the east, the Wabanaki Confederation experience includes over five hundred years since Europeans first landed on their shores and discovered the rich and thriving environment with the original Indigenous nations. The Wolastoqey Nation is a member of the Wabanaki Confederacy. The seven Wolastoqey First Nations are all located along Wolastoq (translated to "beautiful and bountiful river.") Sometimes referred to as the Maliseet Nation (a Mi'kmaq word assigned to the region by settlers), the people refer to themselves as Wolastoqiyik. As members of the Wabanaki Confederacy (translated as "People of the Dawn"), they work together with the other confederacy members from the Mi'kmaq, Passamaquoddy, Abenaki, and Penobscot Nations along the eastern coastline from Maine in the south, north to Newfoundland and westward to the eastern shoreline of the St. Lawrence river. The oral traditional teachings place the people of the Confederacy in this region since time immemorial.

As the people who welcomed the first settlers onto Wabanaki territory, they also experienced the longest and in some cases the cruelest contact. Their treaties with the settlers were established in the early 1700s and are described as Peace and Friendship Treaties by the colonial powers and the original people of this region. The original people

of this territory always understood these treaties would ensure the co-existence, peace and harmony of future developments of the land and its bountiful resources across the region. These treaties are being recognized by governments and the courts as everyone does the work required to re-establish their original nation-to-nation relationships with each other.

The traditional teachings, stories and songs from across the region are shared by the Elders using their original language whenever possible. These teachings continue to be passed along from one generation to the next by the few remaining teachers with this knowledge. These Elders are gifted with the task and the sacred knowledge to continue the work required to protect and sustain this information for future generations. They are recognized by their ancestors, other Elders, the community and the nations as those who carry these responsibilities in a good way. These songs, stories and teachings contain the information for others highlighting ancient knowledge, deep understandings, and strong relationships with the water, the land, our four-legged relatives, the plants, the winged ones along with all the resources and gifts available on Turtle Island.

In their travels to other Indigenous nations, the Elders and their students are discovering the teachings and ceremonies from their own regions are very similar to those shared by their hosts. These teachings include the four directions and the four families of humans; the ceremonies and traditions; the similarities within their languages; the role of Elders; and the use of various tools to protect and sustain their knowledge for future generations. It is with these similar traditional teachings the People of the Dawn have been able to survive for thousands of years.

This report is dedicated to the speakers of the many Indigenous languages in Canada. They are the keepers of a treasure-house of knowledge and wisdom far beyond the two official languages that most of us speak in this country. There is a greater variety of languages based in Canada than based in Europe today. Indigenous languages offer all of us an alternative way of seeing our world, rooted in a deep respect and understanding of how to live in harmony with our planet. When considering the significant threats to our environment and our social systems created by people using Western world views and practices, the wisdom offered by Indigenous languages and their inherent ways of understanding is a precious resource.

Yet in the context of settler colonialism in Canada, the Indigenous language speakers are faced every day with barriers, restraints, and pressures to switch from their native tongue to English and French. As described by Verna Kirkness: "Formal education has from the beginning sought to destroy not only our languages but our whole philosophy of life" (Kirkness, 1998:3). In schools across the country, most Indigenous children receive little or no encouragement to speak their traditional language. Most Indigenous languages in Canada are endangered or almost extinct.

At the same time, in every Indigenous community across Canada, the language speakers are doing the work to keep their languages strong and a living part of their communities. Efforts include everything from local TV and radio broadcasts in the Indigenous language to local immersion schools. Some communities have been inspired by the progress of the

Maori in New Zealand who have successfully used "language nests" as a core strategy for Maori language revitalization. New Zealand, however, has one Indigenous language; Canada has 52, and scarce resources available for the significant work required to support Indigenous languages.

This report includes a discussion of one aspect of this work: the use of digital technology to support Indigenous language revitalization. As discussed throughout this report, using digital technologies to support Indigenous languages is happening in most if not all Indigenous communities across the country, made simpler now with the widespread availability of digital recording devices. Practices range from searching for and using Indigenous language resources available online, digitally recording local language speakers to building and using language apps on mobile devices.

4 Using an Indigenous methodology to produce our report

The project team prepared this report using a process best described by the following Indigenous methodology. The team drew on the work of the principal investigator, David Perley. His doctoral research at UNB involves extensive work with the Elders from across the region to identify and present the Wolastoqey epistemology. As a respected Wolastoqey Elder, David Perley worked with project team to guide the development of this report. Our plan is to share the results of this project with other Elders and the communities across the region as well as with anyone interested in the topic. The objective is to ensure the work continues and is able to support others as they undertake their own language and cultural revival initiatives in their communities, organizations and institutions.

The following presentation briefly describes David Perley's research methodology that guided this project as we gathered the information required to produce this report (Perley, 2016). The following illustration is a research map of the traditional teachings and worldviews belonging to and shared by different Indigenous nations. The "medicine wheel" teachings were gathered and shared by the late Gwen Bear, the first Elder-in-Residence at UNB who travelled to the nations in the west to learn from them. Recognizing the similarities of our own values and teachings, the people are making these teachings work in our territories. Using the Wolastoqey epistemology, the team followed the steps described below to produce this report.
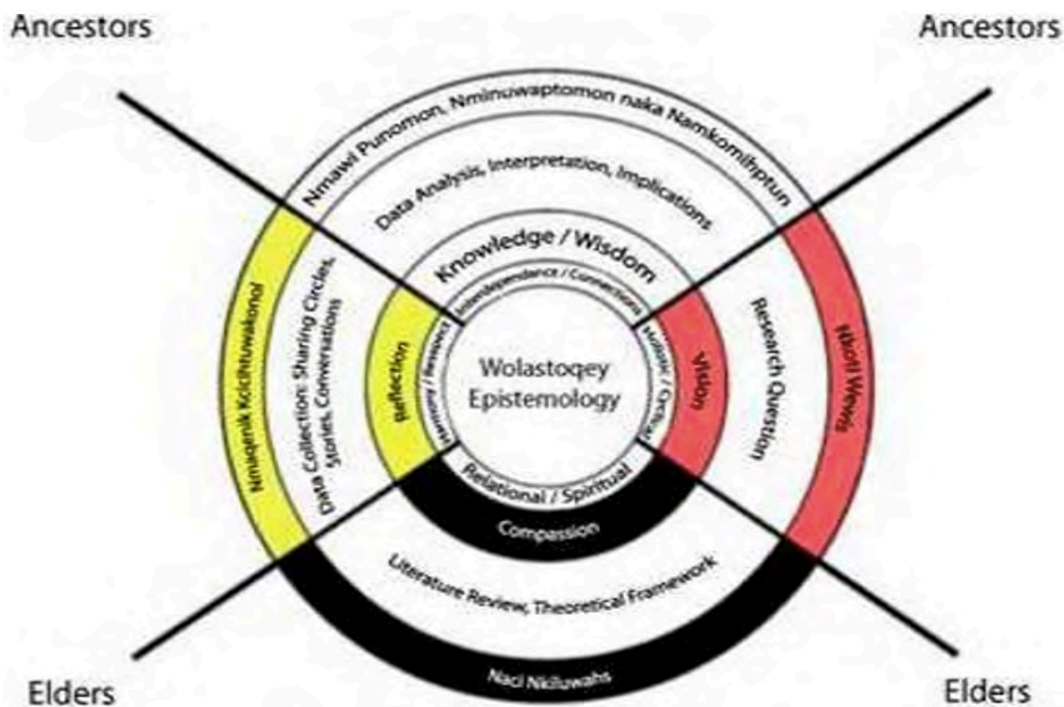
In the east is where new life comes into this world. It is where the questions are identified and the journey begins to clarify the work to be undertaken. It is where the teachings, ceremonies and traditions of the culture are found that guides the work to done. It is from this direction that the young ones and their teachers are introduced to their physical world. It is here they are taught their first teachings appropriate for the age group. Continuing to the south, each of us enter our youth stage of life, spending time with the Elders who help the youth find their gifts and their own life paths. Introduction to the ceremonies and preparation for all our life's work occurs during this period of our lives.

It is in the south where the work begins to seek the knowledge from the Elders and teachers. Researchers identify the paths required to find the answers to the questions and the information needed to complete the work. The adult world found in the west where we strengthen relationships with others and learn the teachings and the traditional knowledge to help us answer the questions being considered. It is in the west where the knowledge is used to help us raise our families. Finally, in the north the information is prepared and shared so the results can be used by others and continue to be built upon to support further work and use of the knowledge being shared. Elders work with the knowledge learned to continue sharing and growing through ceremonies to prepare others to carry on the work necessary to support the nation. These directions and their teachings are linked within this spherical representation supporting the Circle of Life describing the connections between the mind and the heart (north to south) and between the physical to the spiritual (east to west).

Similarly, starting from the centre of this methodology, the values and teachings of interdependence / connectedness, holistic / cyclical, relational / spiritual, and harmony /

respect are described as Wolipomawsuwakonal, or the teachings of being one with all of creation. The information gathered, including the traditional stories and understandings are obtained and shared by Elders in the communities and their ancestors who ensured this information is always being passed along from one generation to the next. Today, we are also gathering the information shared in a digital format and in print from many different sources and Indigenous nations. The four colours represent the four families working together to complete the Circle of Life. To ensure the continuity and use of the knowledge, there is the need to respect and share the knowledge and information with others so they can use it build and create new knowledge.

Again, from the east, we begin the information gathering process by identifying what we are investigating and opening our minds to new knowledge (Nkoti Wewis). This step helps us plan where and how we will search for and hopefully find the information we require by working in a systematic manner. It involves developing the questions being asked and the strategy (vision) for completing the work in a holistic and cyclical until the work is complete. The process involved in developing, accepting and introducing the project to everyone occurs during this stage of development.

Moving to the south, we worked our way through the material, made the contacts identified by the team to establish our sources of information. This step is referred to as Naci Nkiluwahs (translated as I am going out there to look around for answers and experience the world). In the Indigenous worldview this step involves taking the time to go out to find the answers and understand our relationship with others and to the world influencing our research. From a western academic perspective this step includes completing the literature review which contributes to the information being used by the team. This work involves a compassionate approach as we develop new relationships and explore the spiritual connection to the research work being undertaken.

The project process then moved to the west where we completed the collection of all the information. It is at this stage that the team began the work of understanding the truths based on our experiences and the knowledge obtained from the completed research. Nmaqenik Kcicituwakonoi involves developing and strengthening the understandings of what we experienced and learned by examining multiple sources of information and following different paths to understand the information. The data was collected from different sources including a comprehensive literature search and the collection of online resources identified through interviews, stories, and conversations are now examined and organized. This stage of the methodology requires a respectful reflection and organization by the research team of the information that assists in producing the desired report.

The final step of our work that is found in the northern direction, the team put the information together, documenting our observations, the teachings and what we learned while completing the project, determined the areas where more work is required, making recommendations, and finally we produced the report sharing the results with others. Nmawi Punomon, Nminuwaptomon naka Namkomihptum describes how the wise one (Elders) are understanding and sharing the information they obtained during their journey on this earth. It describes the truths identified and being shared in the report. This is time

for interpreting and understanding the implications of the data and its analysis. It includes making a careful examination of the knowledge and understanding being put together as a result of the research. The information and product is only as useful and important when it is shared and is able to be used by others and most importantly by future generations. The interdependence and the strength of the connections established throughout the project are carefully acknowledged to ensure the work is continued.

The methodology used to complete this report provided each member of the research team with a renewed commitment to continue this work with strengthened knowledge and numerous successful models for language and cultural resurgence. It is our hope that others will find the information being shared useful in developing and sustaining Indigenous languages and cultures across Canada.

5 Indigenous communities and digital technologies

Earlier this year, several members of the project team conducted a comprehensive review of literature related to Indigenous communities and digital technologies (O'Donnell, Beaton, McMahon, Hudson, Williams, Whiteduck, 2016). This review adds context to the discussion of how they are used to support Indigenous language and cultural resurgence. Some of the recommendations from the earlier project are relevant to and included in this report. Indigenous communications organizations have been providing analogue communications facilities and services for their communities for more than 40 years, including two-way radios, community radio stations, radio programming, video and television programming, internet services, cable television, and mobile telephony. Remote, rural and northern Indigenous communities have been adopting digital technologies for many purposes - from telehealth and distance education to remote justice services. Indigenous community members in every region of the country have demonstrated their eagerness and ability to use digital technologies when they are affordable, accessible and meet their needs. To give one example, Facebook is widely used in all Indigenous communities (Molyneaux, O'Donnell, Kakekaspan, Walmark, Budka & Gibson, 2014)

Today in all Indigenous communities across Canada, community members are accessing and using digital technologies in their homes, the homes of friends and family members, community schools, and other community spaces. Those working in the community health centres, local government offices, schools, public works buildings, the airports, water treatment centres, and other community services and buildings are using digital technologies in many different ways to do their work and communicate with other community members and people further away.

Indigenous community members are using a range of devices from smartphones to tablets, notebooks, digital cameras, and videoconferencing units. The infrastructure supporting the digital technology adoption is arriving to the community in different ways: by fibre, coax cable, microwave and satellite. The use of the technologies and infrastructure is often supported by a regional Indigenous community intermediary organization staffed with

technology experts who have learned many tricks over the years to keep all this infrastructure and digital communications operating smoothly.

Indigenous communities are using digital technology, networks, tools and applications in many ways and for a range of uses related to:

- Healthcare, telehealth, and health education
- Economic development, business and entrepreneurship
- Education and distance education
- Indigenous government and governance
- Justice, public safety and emergency communications
- Social media for community interconnection and interdependency
- Indigenous culture and identity
- Commercial entertainment
- Indigenous resurgence, self-determination and activism
- Land-based activities and environmental sustainability

Although there are many exciting uses of and innovations with digital technologies, Indigenous communities are also facing daily challenges with using them. One common challenge is the high level of poverty and underfunding of basic public services. There are many reasons for this situation (Anaya, 2014; Palmater, 2011). At the same time, digital infrastructure costs are much higher in northern, rural and remote communities than in other regions of the country. The economic situation combined with the high cost of connectivity suggests that that many rural, remote and northern Indigenous communities and community members may be struggling to pay the high costs of using digital technologies. The sustainability of digital services is therefore a significant challenge. Aside from high connectivity costs, many other challenges exist for Indigenous community members using digital technologies.

The language used online may be a challenge for some community members and households, especially those more comfortable in Indigenous languages than in Canada's two official languages. It is possible that some community members avoid certain digital applications or devices because they do not support syllabic scripts (they are not available on Android mobile devices, for example). The target audience for most online content and services is the dominant 'Western' population (Pannekoek, 2001; Pasch, 2015). Language is a strong indicator of this bias; English is the overwhelmingly prevalent language used on the internet, while many scarcely-used and endangered Indigenous languages are virtually non-existent.

As a result, the internet and associated technologies may fuel the disappearance of Indigenous languages even as the communities strive to preserve them. This is an obvious restraint to digital technology adoption in Indigenous households. To deflect the globalizing force of technology, the literature highlights the importance of providing community members with access to localized online resources catered to community-specific needs (Dyson & Hendriks, 2007; Gordon, 2006). This effort will help to ensure the protection

Indigenous peoples require to maintain ownership and control over their knowledge, language, and culture (Nickerson & Kaufman, 2005).

Furthermore, much of the existing content representing Indigenous peoples on the internet imposes an outsider worldview that misrepresents and objectifies the culture, thereby furthering a colonialist agenda and contradicting the holistic values that Indigenous cultures uphold (Iseke-Barnes et al., 2007; Perley, 2009; Todd, 1996). At the same time, there are many examples of Indigenous organizations and communities using digital technologies to preserve Indigenous languages, as discussed earlier in this review. Pasch (2015) provides an excellent discussion of the "double-edged sword" of digital technology, including both utopian and dystopian views about bringing cutting-edge technologies into Inuit communities.

The most recent research on Indigenous community connectivity suggests that significant new investments will be needed to increase broadband capacity in northern and remote Indigenous communities. To be sustainable, building, upgrading and maintaining broadband infrastructure in northern and remote Indigenous communities across Canada will need significant ongoing investment by government partners. Some examples of successful funding partnerships are the Northern Indigenous Community Satellite Network (McMahon, 2014), the Kuhkenah Network (Carpenter, 2010), and, most recently, GwaiiTel, that brings broadband to two northern islands in BC. That service was created as a not-for-profit society made up of three municipalities, two Band councils, two unincorporated areas and the Council of the Haida Nation (Leask, 2015).

Whiteduck, Beaton, Burton & O'Donnell (2012) and McMahon, Gurstein, O'Donnell, Beaton & Whiteduck (2014) describe how telecommunication service providers are reluctant, slow or refuse to develop infrastructure in remote and northern regions without significant government investment. Consequently, it is often very challenging to build the partnerships necessary to develop broadband infrastructure and provide equitable and affordable internet services in many remote and rural regions of the country. Government policy to support broadband in remote and northern Indigenous communities is underdeveloped and uncoordinated among different federal departments and program areas. Too often public funds paid to telecom providers are first used to develop their regional infrastructure resulting in the communities at the "end of the road" remaining underserved or unserved (Philpot, Beaton & Whiteduck, 2014).

According to McMahon, O'Donnell, Smith, Walmark, Beaton and Simmonds (2011), the First Mile approach to telecommunications development can be leveraged to support economic and community development in rural and remote regions that can otherwise lack employment opportunities. Keeping ownership and control of broadband infrastructure and internet services inside communities helps generate jobs and keep revenues circulating locally. This approach aims to empower members of these communities to build, operate and manage resources such as digital infrastructures and services in ways that best meet their locally-determined needs and aspirations. First Nations across the country are adopting the First Mile approach to developing their digital infrastructure, technologies and language protection strategies.

6 Indigenous resurgence

This section of the report is a brief overview of some Indigenous resurgence theory and approaches. Manuel & Posluns in *The Fourth World: An Indian Reality* (1974) highlight a vision of the future wherein Indigenous societies, have overcome the intergenerational trauma of settler colonialism. In their vision, Indigenous societies have harnessed modern technology within their respective cultural and linguistic frameworks to recover and revitalize their languages, cultural worldviews, and ways of living. Technologies are understood to be decolonizing tools of Indigenous resurgence.

Many current theories of Indigenous resurgence are rooted in Fourth World theoretical underpinnings. The Center for World Indigenous Studies (http://cwis.org/) is an independent, non-profit research and education organization that hopes to foster better understanding of the lived experiences of Indigenous peoples through the publication and distribution of literature written and voiced by leading contributors from Fourth World Nations. The basic assumption of Indigenous resurgence is that this type of progressive vision for a just society can come about only when Indigenous nations again achieve security, and control over their own destinies. Indigenous resurgence is a journey towards that vision, and embraces action-based, praxis-oriented research to holistically confront outdated modes of thinking based on race-based, gendered, hierarchal power dynamics and their influence within settler societal structures and institutions.

Indigenous resurgence seeks to re-establish a living peace based on mutual respect and the promise to live side-by-side in peace and harmony. Colonial expansion did not adhere to the sacred obligations taken on by the first European settlers. Settler colonialism continues to negatively impact the original ways of living that existed before contact with Europeans. The historical legacy of settler colonialism and its assimilative demands is directly connected to the current socio-economic and geo-political struggles faced by Indigenous people. Indigenous resurgence is about undoing that damage and re-establishing those original ways of living within a modern context.

Indigenous resurgence focuses on the historical narratives and lived experiences of those nations that resisted, and continue to resist colonial expansion and intervention, with the hope of recovering and revitalizing the original ways of living that existed before settler colonialism within a modern context. Indigenous people and nations worldwide are decolonizing the societal and institutional structures that are blocking their holistic growth. Digital technologies can greatly enhance this process and provide Indigenous nations with additional tools to reach their goals.

Tracing the roots of Indigenous resurgence

Two divergent worldviews have been opposing each other for generations in Canada. One worldview, steeped in European values, worldviews, and languages has become the dominant social reality. Indigenous nations have systematically been forced into accepting this social reality in various ways. The second worldview involving Indigenous resurgence

is concerned with the lived experiences of the many Indigenous nations who are bonded by cultural traditions, language, and territory recognizing how their entire traditional ways of living are impacted by settler colonialism.

Here in Canada, many Indigenous nations are living marginalized life experiences within their own traditional territory. In most cases they are struggling to maintain their linguistic and cultural identity. Indigenous resurgence seeks to critically analyze and challenge settler colonialism wherever it exists. The settler societies that grew out of European colonial expansion continue the intergenerational harm that displaces Indigenous knowledge and ways of living. Settler colonialism has at its core the desire to replace Indigenous perspectives, worldviews, and ways of living. In the development of Canada this process of colonization was done in many ways. From the initial outright assault and warfare predominantly by English forces, culminating with the *British North America Act (1867)* and the *Indian Act (1876)* that arbitrarily, with little Indigenous consultation, gave Canada dominion over Indigenous lands, waterways, peoples and nations.

In North America, in particular Wabanaki territory, settler colonialism effectively dismantled the original negotiated treaty relationships between Indigenous and European peoples and nations. In many ways these treaties espouse Indigenous wisdom and ways of knowing, and were based on living side-by-side, in mutual peace and harmony. Settler colonialism and settler nations continue to negatively impact and disempower Indigenous holistic growth, hampering resurgence efforts, and most times unwittingly so. Settler colonialism is manifested by racist behaviours, thoughts, attitudes and actions that impose top-down power-dynamics. Racism places people with settler ancestry and values, languages and ways of living as superior to Indigenous societies and nations. (Palmater, 2011). Until these outdated modes of thinking and action are confronted they will continue to create strife within society. They will continue to marginalize and deny the human and civil rights of any person or groups of people who do not identify with the dominant culture and values within a settler society. Indigenous resurgence and our attitudes about it really speak to the broader state of humanity within our society and the future growth of our collective humanity worldwide.

Indigenous resurgence in modern times

Alfred & Corntassel (2005) see resurgence in modern times as a living commitment to meaningful transformations within society that allow for Indigenous ways of living to exist in their own way within the broader Canadian mosaic. This means regenerating Indigenous cultures, and surging against the power-dynamics and paternalistic attitudes that keep Indigenous nations bound to their colonial past. For many Indigenous nations worldwide the colonial period never ended. In order to move towards self-determined and authentic ways of living the current social reality has to be confronted in a holistic way that moves towards collaborative efforts to change. Indigenous resurgence has to be a peaceful journey because in the end how we choose to fight will determine who we become when the battle is over and the ultimate goal of Indigenous resurgence is to allow for future generations to live peacefully side-by-side with settler societies. Revolution within an Indigenous paradigm is spiritual, a culturally rooted social movement that transforms the whole of

society and a political action that seeks to redefine the power politics affecting the current relationship (Alfred & Corntassel, 2005).

Simpson (2011) defines resurgence as a chance for Indigenous people to define themselves in a contemporary context, to reclaim Indigenous knowledge for the betterment of Indigenous society in modern times. Simpson writes that for reconciliation to be meaningful it must be a decolonizing force, grounded in cultural regeneration and political resurgence and a mutual agreement between Indigenous and settler societies to work towards a collective re-balancing of the playing field. Tuck & Yang (2012) state that decolonization should not be viewed in terms of a Western doctrine of liberation; decolonization specifically requires the repatriation of Indigenous land and life, and must support recovering and revitalizing Indigenous knowledges, languages and worldviews and the original social structures that existed before contact with Europeans. For most Indigenous groups marginalized within settler societies there is no access to language immersion outside of European languages.

Corntassel (2012) warns that reconciliation without meaningful restitution merely re-inscribes the status quo without holding anyone accountable for ongoing injustices. To be effective, Indigenous resurgence has to focus on regenerating Indigenous knowledges, languages and worldviews and re-establishing the holistic land-based processes that will develop generations of people who think, act, speak and live in Indigenous ways (Simpson 2014). The historical legacy of assimilative policies since contact with Europeans has decimated these traditional knowledge exchange processes in Canada. Repairing the damage begins with repatriating control of the social determinants affecting the holistic growth of Indigenous society and addressing key societal issues and structural obstacles maintained by settler societies (Alfred & Corntassel, 2005; Simpson, 2014; Tuck, 2009). In essence, re-establishing Indigenous knowledge exchange processes is critical in rebuilding Indigenous ways of living and ending the intergenerational trauma of settler colonialism. Digital technologies provide tools for re-establishing these traditional ways of living at the local level in so many ways.

7 Indigenous language revitalization

Critical to understanding Indigenous resurgence is the dire state of Indigenous languages in Canada. With each generation of Indigenous learners forced into Euro-centric educational structures to learn European languages, Indigenous languages are fading away. Recovering and revitalizing Indigenous languages is the important first step on the journey towards Indigenous resurgence. Indigenous languages contain critical cultural knowledge that inform Indigenous worldviews and values. Where Indigenous nations globally have overcome the intergenerational trauma of settler colonialism, recovering, storing, and revitalizing Indigenous languages was key to their success. Digital technologies have empowered and enabled Indigenous peoples worldwide to take great strides towards this goal.

Perley (2011) in *Defying Maliseet Language Death* highlights an intimate connection between speaking a language and developing a cultural identity. Languages are lenses through which we view the world, develop values and establish our own identity. Perley (2011) suggests that the loss of Indigenous languages is not merely the extinction of a language but has long-lasting implications for Indigenous culture, identity and self-determination as well. Francis & Sable (2012) identify the nature and structure of Indigenous languages and their implicit meanings, as the unique reflection and expression of how an Indigenous culture interacts and perceives the world. With digital technology, Indigenous peoples have the tools to supplement language recovery, revitalization, promotion, and learning efforts. Every day new technologies are emerging, providing additional domains for language use to surface (Galla, 2016).

Recovering and revitalizing Indigenous languages

McCarty (2003) identifies language loss and revitalization as human rights issues. The loss of a language reflects the inherent power dynamics of settler colonialism. Efforts to revitalize Indigenous language cannot be divorced from larger struggles for democracy, social justice, and self-determination. In the move towards sovereignty and self-determination, digital technologies are empowering local efforts by Indigenous nations to recover and revitalize their languages through locally controlled education structures. Battiste (2013) suggests that designing inclusive education in Canada must begin by confronting the hidden racism, colonialism, and cultural and linguistic imperialism in the modern curriculum and addressing the theoretical incoherence with a modern theory of society.

Battiste (2013) identifies many levels of collaboration and mutually defined goals within Indigenous, action-based paradigms as key to successfully gaining local control of Indigenous education in her territory. Mi'kmaw Kina'matnewey (MK), an Indigenous education authority in Nova Scotia, is a leading example of how empowering Indigenous knowledges, languages and worldviews to flourish within settler societies has shown to improve the holistic growth and development of Indigenous societies. MK has blended the technology of the modern world with the wisdom of their ancestors to deliver their own educational model. With the assistance of digital technology, the Mi'kmaw have been able to produce culturally-appropriate educational materials for use in Mi'kmaw communities and households and has shown unprecedented improvements in educational success for Mi'kmaw students living in Nova Scotia (Lewington, 2010).

McCarty (2003) in her study on recent developments in heritage language immersion in the United States found language immersion to be the pedagogy of choice among Indigenous communities seeking to produce a new generation of fluent Native language speakers. Her study looks at Hawaiian languages and their progress with immersion. The Indigenous language of Hawaii by the mid-20th century had only a few hundred speakers. Two major events were key to the resurgence, a 1978 constitutional convention designating Hawaiian language as an official language, followed by direct action by a small group of parents and language educators who began developing their own immersion program inspired by the work of other Indigenous groups worldwide. The Hawaiian *Aha Punana Leo* immersion

program began in 1983 and is still going today, crediting their success to focusing on recreating the cultural environment and processes that developed Indigenous languages before settler colonialism arrived within a modern paradigm. McCarty's study also looks at the success of immersion programs of the Navajo and the Keres-speaking Pueblos of Acoma and Cochiti. All of these Indigenous languages were close to extinct. Recovering and revitalizing their language was a priority of the Indigenous community, and ultimately, collaborative efforts were required by Indigenous and non-Indigenous people.

8 Technologies for Indigenous language and cultural revitalization

The widespread development and availability of the internet and digital technologies has provided Indigenous people with a means to recover, revitalize, and develop their languages within a modern framework. Settler colonialism and its assimilative policies, in particular residential schools, focused directly on destroying Indigenous languages, and as a result, especially in Wabanaki territory, fluent speakers are becoming a rarity. In many cases within settler societies Indigenous languages were not able to adapt to a rapidly changing society and status-quo that was imposed upon them.

Online tools and digital technologies have empowered Indigenous peoples with life-long learning opportunities that have practical applications in their daily lives (Beaton & Carpenter, 2014). For Indigenous learners and communities who are geographically separated by provincial borders within their territory, digital technology allows for instant communication in which learners and speakers interact in real time leading to greater local resiliency (Galla, 2016; Molyneaux et al., 2014). In these modern homogenizing and globalizing times, digital technology creates culturally appropriate learning environments for language learners and speakers, supports networking amongst these groups, and enables curriculum development across great divides (Galla 2016).

It is important to keep in mind that Indigenous resurgence is happening worldwide. Each Indigenous nation impacted by settler colonialism is unique, and the long term impact inflicted has manifested differently in those respective areas. However, they do share commonalities in dealing with a historical legacy of assimilation that has blocked the holistic growth and development of their entire nation and subsequent generations. They also all share the desire to repair the damage and re-establish their original ways of living that existed before contact within a modern context.

The Wabanaki Peace and Friendship Treaties offer a vision for a holistic reconciliation of settler colonialism: to live side-by-side in mutual peace and harmony. This type of end-result is feasible, and has in various ways come to fruition worldwide. It is critical to Indigenous resurgence that settler peoples and authorities reconsider preconceived notions of a democratic and inclusive society, and match the local, grassroots resurgence efforts led by Indigenous people and nations. The growth of the internet and digital video has helped to enable and empower Indigenous resurgence, and will help to re-establish Indigenous ways of living in modern times. This section will highlight some of those efforts.

The annotated bibliography, Appendix I of this report, contains many examples of digital technologies supporting Indigenous resurgence. The literature included was limited in scope to Canada, the US, Australia and New Zealand. This section includes a few examples drawn from the annotated bibliography that highlight effective examples of Indigenous resurgence using digital technologies.

Candace Galla, an Indigenous researcher with Hawaiian roots currently working at the University of British Columbia, is featured prominently in the annotated bibliography. Her research is contemporary, action-based and offers great insights on developing and harnessing digital technology for language recovery and preservation. Her 2012 article, *Sustaining Generations of Indigenous Voices: Reclaiming Language and Integrating Multimedia Technology* highlights how digital technology used within an Indigenous framework is an effective tool for connecting Indigenous Elders with youth. Although not a replacement for traditional language learning processes, supplementing traditional language learning methods with digital technologies enables interconnection between Elders teaching the language and the younger language learners more adept with digital technology. Collaboratively they are able to document and protect the integrity and depth of their language while empowering traditional uses of modern tools within an Indigenous paradigm.

Incorporating Technology into a Hawaiian Language Curriculum authored by Ka'awa and Hawkins (1997) highlights the recovery of a near-extinct Indigenous language through intergenerational collaborative efforts to decolonize educational structures for Indigenous learners. The article shows that locally controlled education, assisted by digital technologies, can empower language and cultural revitalization. Like many Indigenous nations impacted by the intergenerational trauma of settler colonialism, Hawaiians had to confront the ways settler society marginalized their traditional ways of living and communicating. Digital technologies have provided a means for overcoming these great divides and enabled more inter-community engagement. This story is just one of the many local efforts Hawaiian peoples have made in recovering and revitalizing their language and cultural ways of living by embracing western technology and adapting it within a culturally appropriate framework.

A Critical Understanding of Adult Learning, Education and Training Using Information and Communication Technologies (ICT) in Remote First Nations authored by Beaton & Carpenter (2016) highlights how digital technologies are empowering self-determining acts of resilience at the community level. The communities that took part in this study are part of one nation but are separated by distance and physical geography, making inter-community engagement difficult. Digital technologies are enabling community members to overcome those obstacles and enabling various forms of online communication in real time. *Social Media in Remote First Nation Communities,* authored by Molyneaux et al. (2014) also focuses on the use of social media by Indigenous communities separated by distance and geography. Social media has presented a way for these communities to connect and has empowered Indigenous language use and cultural resilience.

Digital Songlines: The Use of Modern Communication Technology by an Aboriginal Community in Remote Australia authored by Buchtmann (2000) highlights how Indigenous communities in remote Australia have embraced digital technology and adapted it to meet their cultural and linguistic needs. Focusing on self-determination through locally controlled policy making, two Indigenous communities collaboratively worked with state authorities to enable self-determination at the local level. In their case, colonization had disrupted traditional means of communication, and digital technology has enabled these communities to reconnect using modern technology, allowing for more solidarity and a stronger move towards sovereignty and self-determination.

9 Indigenous language revitalization in Wabanaki territory

This section of the report highlights some of the digital technology initiatives taking place across the Wabanaki Confederacy in Atlantic Canada region. This review provides a glimpse of the work required to ensure the Indigenous languages and culture are protected and sustained for future generations. Being the first region in Canada to be colonized created many unique challenges for the First Nations and Indigenous members of the Wabanaki Confederacy. Their resiliency and determination to protect their languages and culture is found in the creative work being undertaken by individuals, communities, their organizations and the institutions across the region.

Similar stories of resiliency can be found in every Indigenous nation and region across Canada, as is demonstrated in the rich collection of literature and online resources included in the appendices of this report. Highlighting the Atlantic region and revitalization work being undertaken here is intended to support others to share their own collections and program models being used to create the resurgence of Indigenous languages and culture across the country.

It is often highlighted how few fluent speakers are left across the region (Tompkins et al., 2011). In New Brunswick, of the estimated 3,000 Wolastoqey, only 300-400 speak their language (CBC Online, 2016). Traditional cultural gatherings and ceremonies were suppressed by the colonizers for many years. Some Indigenous groups choose to follow the western culture and religions that often actively advocate against reviving the Indigenous languages and ceremonies. Similar struggles exist across Canada as Indigenous people begin the self-determination work of establishing and operating their own communities, political systems, institutions, businesses and organizations to support their language and culture renaissance. It is an exciting time to be part of this work.

The following examples of Indigenous language and cultural revitalization showcase the work being done by individuals, communities, Indigenous organizations and academic institutions. These examples are a small part of the important work being done in the Atlantic region. Similar efforts are identified in Appendix 2, in the list of online resources and examples from other parts of Canada as well as internationally.

Language and culture revitalization efforts led by individuals

At a 2016 gathering, the Mi'kmaq Wolastoqey Centre at the University of New Brunswick honoured three "Language Carriers" who worked together to produce a children's book in their Wolastoqey language (UNB News, 2016). The three youth from Kingsclear First Nation are contributing the proceeds from their book to the local school they attended as children. Celebrating the work of young people can be found in the First Nation schools where role models and excellence is regularly rewarded.

Annie Clair from Elsipogtog First Nation hosted 'Pjilasi Mi'kma'ki', a bilingual Mi'kmaq/English podcast to support the use of Mi'kmaq in community schools (https://pjilasimikmaki.wordpress.com).

Elders are working with their allies to record and share their stories, knowledges, teachings and culture. Imelda Perley (UNB's Elder-in-residence), following the example of Verna Kirkness and others, advocates for everyone to be recording and sharing their languages so it is available for the people who will use these valuable archives to re-learn their Indigenous language. (UNB Alumni Magazine, 2016)

Immersion schooling in the Maliseet language was the focus of a SSHRC-funded project to revitalize Maliseet in St. Mary's First Nation led by Andrea Bear Nicholas (Saint Thomas University, 2010).

Language and culture revitalization efforts in Indigenous communities:

The fifteen First Nations across New Brunswick each have their own web sites that describe their communities and the various language and cultural activities being undertaken. For example, Metepenagiag First Nation (http://metepenagiag.com/rbcommunity_en.htm) uses Mi'kmaq throughout their site to describe their community. Many First Nations are replacing their colonial community name used by the federal government with their traditional Indigenous name. The Metepenagiag Heritage Park has its own web site at http://www.metpark.ca, providing a wealth of knowledge about their history and culture.

Often First Nation schools are the site of the language revival efforts. The local schools are supported by their regional organizations who develop curriculum resources and deliver culturally appropriate professional development. Some of the funding for the local language and cultural programs and initiatives are supported locally and regionally by the federal government's Indigenous and Northern Affairs department under the New Paths and the First Nations Student Success programs.

The Eskasoni First Nation Immersion School works with their regional education authority, Mi'kmaw Kina'matnewey, and Atlantic Canada's First Nation Helpdesk to access digital equipment and the network connections. Local and regional curriculum teams are preparing online materials for use in the classrooms. Eskasoni First Nation opened their new immersion school facility in September 2015. For ten years it shared the same building

with their English speaking education center when Mi'kmaq immersion was first introduced in the community. The new Mi'kmaw immersion school includes the Ta'n L'nuey Etl-mawlukwatmumk Mi'kmaw Curriculum Development Centre that assists educators in developing and translating educational curriculum materials into Mi'kmaq (Julian & Denny, 2016; Tompkins et al., 2011).

The Listuguj First Nation Education Directorate established their kindergarten to grade 2 Language Immersion program working in partnership with a number of different organizations for the past several years. The community is in the Gespe'g territory of the Mi'gmaw; located on the southwest shore of the Gaspé peninsula. They attribute the success of their program to the people who share a commitment to immersion; capable personnel; planned certification for immersion teachers; strategies for development of curriculum/teaching materials; and partnerships with other bodies with expertise in developing immersion programs (Simon, 2014). Their online resources include the talking dictionary project (http://www.mikmaqonline.org) that is an ongoing development for the Mi'gmaq/Mi'kmaq language. The project was initiated in Listuguj, therefore all entries have Listuguj speakers and Listuguj spellings. In collaboration with Unama'ki (Cape Breton), the site now includes a number of recordings from Unama'ki speakers. More words and phrases are being added as they are recorded. Eventually this site will include the Smith-Francis spelling of the Mi'kmaq language that used in Unama'ki.

Language and culture revitalization efforts by Indigenous organizations

The Mi'kmaw Kina'matnewey (MK) Educational Authority (http://kinu.ca) represents the educational interests of 12 Mi'kmaw communities in Nova Scotia. However, unlike a school board, Mi'kmaw Kina'matnewey serves rather than directs the activities of its members' local schools. With Mi'kmaw-focused teaching pedagogy, schools seek to engage students in a successful education experience. Among many outcomes are an 88% high school graduation rate; increased literacy and numeracy; and a Mi'kmaw Kina'matnewey Student Information System. Twenty years ago, the Mi'kmaw Kina'matnewey communities hoped students would graduate and go to post-secondary, now they expect the students to graduate and exceed provincial students (Simon, 2014).

Digital technologies are supported extensively by MK and their team operating their Atlantic Helpdesk service (http://fnhelp.com) that has been serving all the First Nation schools in the four Atlantic provinces since 1997. Today, every First Nation in the Atlantic region has access to a fibre connection shared with the health centre and school along with other buildings in the community. Videoconferencing is supported by the Helpdesk staff to connect all the First Nations to a variety of programs and services. New online language apps are being developed and shared from their web site (Milliken, O'Donnell & Gorman, 2009).

In New Brunswick, the First Nations Education Initiative Inc. (http://fneii.ca) worked with their partners to create the Wolastoqiyik & Mi'kmaq Culture Studies Online Resources web site (http://www.initproductions.ca/acproject/about.html) containing a variety of curriculum resources for teachers and families across the region. The site highlights Elder

scholars by introducing them as our "language and culture carriers" as well as our "knowledge and wisdom keepers" who are guided by ancestral teachings passed down from generation to generation. These teachings provide guidance for everyday living and how we should interact with the physical, social and spiritual environments.

Language and culture revitalization efforts by regional and academic institutions

Most universities across Canada are now providing a variety of support services in partnership with the Indigenous students, institutions and communities in their region. At the University of New Brunswick, the Mi'kmaq-Wolastoqey Centre (http://unb.ca/mwc) was established to provide this service. MWC delivers a variety of language and cultural programs in partnership with the students, communities, their local and regional organizations, the university, and the provincial and federal governments. The centre hosts the Passamaquoddy-Maliseet Language Portal (http://pmportal.org) containing over 18,000 words and phrases supporting the use of the language. A new Wolastoqey language application for mobile devices is presently being developed and is presented further in this report.

The School of Linguistics and Applied Language Studies at Carleton University is working with a number of Indigenous organizations to create the The Algonquian Linguistic Atlas (http://www.atlas-ling.ca). The project is a multi-year SSHRC-funded initiative supporting the development of online Indigenous language dictionaries (http://resources.atlas-ling.ca). The online atlas allows you to listen to various phrases spoken in different Indigenous languages, including the Mi'Kmaq language.

10 Resources online for Indigenous language revitalization

Often times technology is seen in a negative light, that it is keeping children on screens rather than outdoors. Although there are reasons for the negative attitudes towards technology, it can also be a great resource in revitalizing language and culture. This section of the report reviews some of the digital resources listed in Appendix II of this report. It was written by a young Indigenous university student (Shaina Peter-Paul) working on the project.

The resources created to aid in the resurgence of Indigenous language and culture span across the digital technologies available, from websites to apps. There are websites dedicated to providing oral teachings from Elders about the creation of the original nations, and there are also websites that record, archive and provide lessons for almost all Indigenous languages. These websites were only the start; with social media emerging in mainstream society, many individuals turn to social media to spread their message to an ever growing online community. Appendix II includes many resources available to anyone looking for ideas and support in revitalizing Indigenous cultures. The resources highlighted in this section are leading the way.

The Four Directions Teachings website is a great resource for knowledge of our Indigenous ancestors. The interactive website contains audio of Elders providing an oral teaching of the creation stories of five of the original nations of North America: Mi'kmaq, Cree, Blackfoot, Mohawk and Ojibwe. The storytelling of how these nations came to be are paired with striking visuals that keep you wanting more. Making resources interactive and modern like the Four Directions Teachings, keeps an audience engaged and returning back to the website. I had been introduced to the Four Directions Teaching website around four years ago, and even though there have been no recent additions or changes in the website, I continue to come back to the website just to hear the Elders speak and watch the videos. Not only can this website be used individually, the Four Directions Teachings website also provides learning activities that can be utilized by educators for their teachings. As an emerging educator myself, I now look at this website with a different perspective. I can see how this website can be used within a classroom to engage students with the cultural information shared. The structure and layout of the website is what makes it so engaging, making you want to click refresh so you can listen and watch the creation stories of each nation over again. Creating a website like the Four Directions Teachings with their unique features of oral teachings by Elders paired with the visuals will capture the audience needed for cultural resurgence.

Images speak louder than words, and this can be seen through individuals who are using photography for indigenous revitalization. Red Works Photography honed their photography skills to empower Indigenous people across North America. The founder of Red Works, Nadya Kwandibens had created a photo series titled 'The Concrete Indian" which had the sole purpose of highlighting Indigenous people within society today. The vision statement for Red Works is just as empowering as their images,

"We, as Indigenous people, are often portrayed in history books as Nations once great; in museums as Nations frozen stoic; in the media as Nations forever troubled. These images can be despairing; however, my goal seeks to steer the positive course. If our history is a shadow, let this moment serve as light. We are musicians, lawyers, doctors, mothers and sons. We are activists, scholars, dreamers, fathers and daughters. Let us claim ourselves now and see that we are, and will always be great, thriving, balanced civilizations capable of carrying ourselves into that bright new day" (Red Works, 2016).

Another photography group, Blue Earth Photography captures images of communities to empower and strengthen Indigenous people. Much like Red Works, Blue Earth want to capture Indigenous people as they are currently within society to show the resilience of Indigenous people. Tea and Bannock takes a different approach with photography by using a blog to bring together and showcase seven Indigenous photographers. They had made the blog to bring Indigenous women together and let their voice and vision be seen through their photo essays. All of the visual artists mentioned provide a great visual story of resurgence from across North America. Providing stories through images is very empowering and attracts a different audience. As an artistic person, I gravitate towards these photography groups because their images provide stories that words could not express. Utilizing photography, like all three groups have done, can aid in cultural resurgence in a unique way.

Language portals have become a great resource in revitalizing our languages. Most of the language portals have been around for years but what keeps them current is their additions to their websites. An addition to some language portals have been through apps for mobile devices and tablets. Creating an app allows people to a have a convenient way to access these language portals through their devices. The Atlantic Canada's First Nation Help Desk has produced an online dictionary as well as creating two apps, L'nui'sui and Tal-Tluen? that correlate with their dictionary which provides people with mobile devices an easier way to access their language portal. This is only one example of many other online dictionaries that have turned to apps to expand their digital language libraries. The Mi'gmaq/Mi'kmaq Online Talking Dictionary has a twitter account Pemaptoq that tweets every day to share a word/phrase of the day. By following them on twitter, anytime you scroll through your feed, you will see a daily word in Mi'gmaq. Branching out into different forms of technologies and through social media is very beneficial for revitalizing languages as it allows the younger generations to maintain their Indigenous languages through a platform that is already familiar to most.

Another way to utilize social media can be seen through Savannah 'Savvy' Simon. Savvy has taken to social media creating an online community that spreads a message of language revitalization. Savvy is utilizing Facebook, YouTube, Instagram and Twitter to share short videos of her teaching a phrase or word in Mi'kmaq. Not only does she provide language teachings, she uses her platform to celebrate her Mi'kmaq culture as well as all other Indigenous cultures. Using social media as a platform, like Savvy does, is a great place to spread a message while also empowering the next generation to be proud of their culture. Providing that Indigenous voice in social media, like Savvy, allows the younger Indigenous generation to gravitate to those Indigenous role models within social media.

11 Snapshot: A language app project

This section of the report briefly describes one project - the Wolastoqey Language App - to illustrate how an Indigenous language app can be developed in a culturally appropriate way. The project is a partnership between the Mi'kmaq-Wolastoqey Centre (MWC) at the University of New Brunswick, and Atlantic Canada's First Nation Help Desk, a division of Mi'kmaw Kinamatnewey (MK) an educational organization in Nova Scotia. The MWC and MK have worked together in the past delivering UNB distance education courses and have also been partners in an ongoing research project based at UNB, First Nations Innovation. The MWC and its role in language and cultural revitalization, and MK and its role in supporting technology in First Nations in the Atlantic, were discussed earlier in this report.

The goal of the project is to develop a simple app for mobile devices that can be used by Wolastoqey language learners to support their learning in a culturally appropriate way. The app will archive and share traditional Wolastoqey knowledge. One of the project objectives is to train Wolastoqey youth to develop culturally appropriate mobile software apps. Four Wolastoqey youth were hired by MK to work on the project based at UNB during the summer of 2016. The youth positions were funded by the First Nations and Inuit

Youth Employment Strategy - Skills Link program run by Indigenous and Northern Affairs Canada.

The language app project is managed by Imelda Perley, Elder-in-Residence at the University of New Brunswick's Faculty of Education. Imelda is a Wolastoqey speaker and cultural knowledge-keeper. She began the project by spending the first week sharing knowledge about Wolastoqey culture and language. Imelda explained that before starting a language app project it is vital that the software developers are grounded in the cultural context of the language.

To train the youth software developers, the project engaged a company that had previously worked with MK - Ogoki Learning Systems based in Winnipeg, MB. Ogoki is a software development company specializing in software applications (apps) for learning Indigenous languages. According to material on the Ogoki website (http://www.ogokilearning.com), it is a First Nations owned and operated company run by Darrick Baxter, who has almost two decades of experience developing applications for mobile devices.
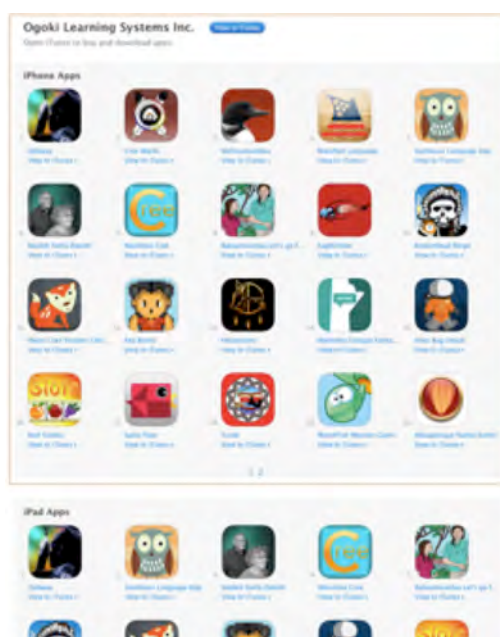
Image 1: Page on iTunes illustrating Ogoki language apps available for download

The core work of Ogoki is developing mobile apps for preserving and revitalizing Indigenous languages. Their approach is to develop apps that capture the imagination of the learner and being to bring educators and students together. One of the company's goals is to "preserve and strengthen the ancestral heritage of Canada's First Nations, Inuit, and Métis people." Darrick has studied at the University of Winnipeg and the Banff New Media Institute. He engineered locative media applications with an experimental HP technology using GPS and location based hardware. He also served a secondment at The Score sports broadcasting network. Under the tutelage of their Mobile Media Director – he experienced first hand the essence of successful business strategies that lead to the development of a hugely successful iPhone sports app. Darrick has now returned to his passion of creating exciting applications.

The Wolastoqey Language App project is taking place at the MWC in the UNB Faculty of Education. One of the challenges is availability of the hardware for the youth software developers: ideally, they each require their own computer to work with. During the summer of 2016, when the app development began, the computers were available as they were not needed by UNB Education students. However, in September when classes resumed, the project was stalled while alternative computers could be found. The applications developed are now in the process of being reviewed by the MWC Council of Elders.

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Appendix 1: Annotated bibliography

This appendix contains a listing of key articles related to technologies and Indigenous language resurgence.

Title:	Wiring the nation! Including First Nations? Aboriginal Canadians and federal e-government initiatives
Author	Cynthia Alexander
Region	Canada
Reference	Alexander, C. J. (2001). Wiring the nation! Including First Nations? Aboriginal Canadians and federal e-government initiatives. *Journal of Canadian Studies, 35*(4), 277.
Abstract	Governments are turning to new information and communication technologies (ICTs) to enhance service delivery and improve citizen-state relations. E-government initiatives are focussed on renewing administrative structures and processes, and on providing government information and services online. Emerging e-governance initiatives include the use of ICTs, particularly the World Wide Web, to create new patterns of engagement between policy communities and policy-makers. This essay identifies and assesses the Canadian federal government's efforts to ensure that the needs and interests of Canada's indigenous peoples are included in the wired world of government policy initiatives. The essay reveals that beyond the technological infrastructure needs of the First Nations peoples and their communities, federal policy initiatives must address and respond to the non-technical policy issues - from the cultural considerations to the privacy concerns that may be unique to the needs and interests of diverse indigenous communities in Canada - that may constrain the realization of ICTs to support Native peoples' socio-political and economic development objectives.

Title:	The difficulties of online learning for Indigenous Australian students living in remote communities–it's an issue of access.
Author	Sarah Anthony & Michael Keating
Region	Australia
Reference	Anthony, S. and Keating, M. S., (2013) The difficulties of online learning for Indigenous Australian students living in remote communities – it's an issue of access. *Online Journal of Distance Learning Administration*, 16 (2). pp. 1-10.
Abstract	Online learning and new technologies are driving a trend in worldwide education that is not only gaining momentum, it is becoming a juggernaut. While the positives for online learning are clear and are often being touted by Universities and Vocational Education and Training providers as a panacea for educational access, what is not clear is the potential negatives for those who cannot reasonably be expected to engage with online learning. Through a review of current literature and research findings, this paper discusses the difficulties of online learning for Indigenous Australian students living in remote communities who do not have adequate access to online learning technologies. This paper proposes the idea that this seemingly reasonable trend towards increased online learning will in fact be hugely detrimental to this section of Australian society and will see the potential for a widening of the gap in education.

Title:	The K-net story: Community ICT development work
Author	Brian Beaton
Region	Canada
Reference	Beaton, B. (2004). The K-net story: Community ICT development work. *The Journal of Community Informatics, 1*(1), 5-6.

Abstract	An introduction to a web streamed video clip highlighting the work and the philosophy behind the construction and operation of the Kuhkenah Network (K-Net). The Kuhkenah Network (K-Net) provides information and communication technologies (ICTs), telecommunication infrastructure and application support in First Nation communities across a vast, remote region of north-western Ontario as well as in other remote regions in Canada. This private telecommunications network supports the development of online applications that combine video, voice and data services requiring broadband and high-speed connectivity solutions. K-Net is a program of Keewaytinook Okimakanak (KO), a First Nations tribal council established by the leaderships of Deer Lake, Fort Severn, Keewaywin, McDowell Lake, North Spirit Lake and Poplar Hill bands to provide a variety of second level support services for their communities. Kuhkenah is an Oji-Cree term for everyone, everywhere.

Title:	**Keewaytinook mobile: An indigenous community-owned mobile phone service in northern Canada**
Author	Brian Beaton, Terrance Burnard, Adie Linden, Susan O'Donnell
Region	Canada
Reference	Beaton, B., Burnard, T., Linden, A. & O'Donnell, S. (2015). Keewaytinook mobile: An Indigenous community-owned mobile phone service in northern Canada. In L. Dyson, S. Grant & M. Hendriks (eds.), *Indigenous People and Mobile Technologies*, Routledge. Sydney, Australia, 109-124.
Abstract	This chapter traces the development of the Keewaytinook Mobile (KMobile) service in northern Ontario, Canada. Keewaytinook Okimakanak's (KO) Kuhkenah Network (KO-KNET) Services supports many services requiring broadband infrastructure, including the Keewaytinook Mobile (KMobile) cellular service. The KMobile operations model is for partner First Nations to develop, own and operate local mobile services in partnership with KO-KNET. The community-based KMobile development occurs in the face of extreme challenges including geographical, technical challenges; small, dispersed populations; colonial federal policies; and social and organizational restraints. KMobile is a welcome service addressing critical safety and development requirements facing every remote community.

Title:	**Settler colonialism and First Nations e-communities in northwestern Ontario**
Author	Brian Beaton & Peter Campbell
Region	Canada
Reference	Beaton, B., Campbell, P. (2014) Settler colonialism and First Nations e-communities in Northwestern Ontario. *Journal of Community Informatics*, 10 (2).
Abstract	Across Canada First Nation community leaders are adopting the e-Community approach for their local broadband development. E-Community is fueled by the desire of First Nations to own, control, and manage their local infrastructure and online services. The paper develops the concept of the importance of locally owned and managed telecommunication infrastructure supporting First Nation e-Community and local resilience. The First Nations e-Community framework provides choices for local people to remain in their communities and contribute to the growth and positive development in these challenging environments. The First Nations' struggle against settler colonialism to access their lands and resources by the colonial governments and their corporate partners continues today. Strong, resilient First Nations are now in a position to influence and support outcomes that benefit themselves, the lands and others in a positive manner.

Title:	**A critical understanding of adult learning, education and training using information and communication technologies (ICT) in remote First Nations**
Author	Brian Beaton & Penny Carpenter

Region	Canada
Key Words	Critical studies, adult learners, training, land, settler colonialism, decolonization, information and communication technologies, First Nations, remote, Ontario, distance education
Reference	Beaton, B., Carpenter, P. (2016). A critical understanding of adult learning, education and training using information and communication technologies (ICT) in remote first nations. *In Education*, Vol 22, No 1.
Abstract	Through a critical settler colonialism lens we explore how information and communication technologies (ICT) supports learning, education and training and First Nation control of these processes in remote communities. The central theme of the current study is that decolonization is about land and creating the conditions necessary so Indigenous peoples have the opportunity to connect with and live sustainably on their traditional territories. Remote First Nations across Canada face considerable challenges and opportunities related to adult learning and quality education and training programs for local citizens. Our study, conducted in partnership with the Keewaytinook Okimakanak (KO) tribal council, explores how community members living in five remote First Nations in northwestern Ontario are using ICT for informal learning and education and training opportunities. KO and the researchers conducted an online survey of residents of the KO First Nations in early 2014 that included many open-ended response questions to ensure the voices of community members are heard. The critical analysis considers how the survey findings relate to the ongoing project of decolonization, and in particular, how these new ICT opportunities support the ability of community members to stay on the land.

Title:	**Valuing the social economy and information and communication technologies (ICT) in small remote first nations**
Author	Brian Beaton, Franz Seibel, & Lyle Thomas
Region	Canada
Reference	Beaton, B., Seibel, F. & Thomas, L. (2014). Valuing the social economy and information and communication technologies (ICT) in small remote First Nations. Association of Social Economy and Non-Profit Research, Brock University, St. Catherines, Ontario, May.
Abstract	Remote First Nations (Indigenous communities) in Canada are challenging contemporary colonialism with their effective use of information and communication technologies (ICT) supporting their local social economy. Out of necessity caused by scarce resources, the social economy in First Nations uses innovative ICT solutions to support required services, economic opportunities, and sustainable communities. The analysis of a 2014 online survey provides insights into the nature of the social economy in these unique remote communities and how their use of ICT is evolving as their local economy matures. A critical examination of local social enterprises and entrepreneurs through an Indigenous lens supports the resurgence of a healthy Indigenous economy in small, remote communities in Canada's far north. Emerging from 500 years of oppressive and racist colonial regimes, policies, and attitudes, First Nations remain resilient. They are determined to live their lives with dignity, respect, strength, and determination in their traditional territories. Following the teachings and wisdom found in thousands of years of a rich and vibrant history merged with and supplemented by modern communication tools, First Nations are sharing and protecting all their relationships with their natural environment and others.

Title:	**Increasing the accessibility of information on the indigenous languages of Victoria**
Author	Heather Bowe, Julie Reid, & Kathy Lynch
Region	Canada
Reference	Bowe, H., Reid, J., & Lynch, K. (2010). Increasing the accessibility of information on the indigenous languages of Victoria. *Re-Awakening Languages*.
Abstract	The authors have developed a web resource portal that allows easy access to information about the Aboriginal languages of Victoria. Written records of Victorian Aboriginal

	languages include language resources gathered in the 18th and early 19th centuries by government officials and interested private citizens. Some material was published at the time of collection, and is available in the reference collections of major libraries. Other material is only available in manuscript sources in research libraries or on microfiche. In the last 50 years linguists have analysed such material producing overview classifications of the languages of Victoria and, in some instances, complex linguistic descriptions of a particular language. These descriptions, called sketch grammars, are not easy to understand without linguistic training. The portal will enable non-linguists to access this vital language information via the web and provides a comprehensive list of sources for all of the major Victorian languages arranged according to the linguistic classification developed by Hercus (1969, 1986), Dixon (1980, 2002), and Blake & Reid (1998). The resource portal is presented according to geographical regions and languages. It provides a window to information on the languages, their relationship to each other, lists of academic and historical resources, comparative wordlists, simplified grammars with examples, and comprehensive lists of the words collected for each language. It also allows for the uploading of community created resources, such as stories and images, together with an online discussion area. The site has the capability to be expanded to add comprehensive detail for all languages of Victoria, subject to funding constraints. Accessing the information provided by the portal may save communities years of preparatory work when they undertake their language revitalisation programs.

Title:	**Language Vitalization through Mobile and Online Technologies in British Columbia**
Author	Peter Brand, Tracey Herbert, Shaylene Boechler
Region	Canada
Reference	Brand, P., Herbert, T., & Boechler, S., (2016) 'Language Vitalization through Mobile and Online Technologies in British Columbia' in Dyson, L., Grant, S., Hendricks, M. (eds) *Indigenous People and Mobile Technologies*, Taylor & Francis, New York, NY. (p. 265 – 273)
Abstract	British Columbia, Canada, is home to 203 First Nations communities, 34 languages and 61 dialects. Approximately 60% of the First Nation Languages of Canada are spoken in BC. According to the *2014 Report on the Status of B.C. First Nations Languages*, 4.08% of BC First Nations speak an Indigenous language, 59% of speakers are 65 years or older and 65% of communities have access to recordings of their language. Research has shown a link between a strong linguistic and cultural identity and an increase in social, mental and physical wellbeing (First Peoples' Cultural Council 2014). Communities engaged in language vitalization have observed increases rates of high school graduation, which include mature students returning to complete basic education and heightened motivation to attend university and other post-secondary programs. Currently, language apprentices from across BC are completing Master's Degrees to prepare them to support language vitalization in their communities.

Title:	**Indigenous adoption of mobile phones and oral culture**
Author	Fiona Brady, Laurel Evelyn Dyson, & Tina Asela
Region	Australia
Reference	Brady, F., Dyson, L. E., & Asela, T. (2008). Indigenous adoption of mobile phones and oral culture. *Cultural Attitudes Towards Technology and Communications.*
Abstract	Indigenous people around the world are becoming more and more interested in ICT. The aural and graphical characteristics of mobile technology and multimedia, in particular, speak to strengths in Indigenous oral and graphical culture. Yet, despite many successful ICT implementations across the globe, there still remain many questions about Indigenous ICT access and adoption. In order to throw light on some of these issues, this paper examines the adoption and use of mobile phones by Indigenous people and how this fits with Indigenous culture. Specifically, we present a preliminary study of mobile phone

	adoption on a remote island in the Torres Strait with a special focus on Indigenous orality. The study indicates a number of very interesting issues, including an unexpected use of text messaging on mobile phones, as well as phone calls and text messages in the local language Kala Kawa Ya. We tentatively conclude that not only must ICT fit with cultural strengths such as orality but that it must also match key areas of high motivation, such as communication with family.

Title:	**Digital Songlines: The Use of Modern Communication Technology by an Aboriginal Community in Remote Australia**
Author	Lydia Buchtmann
Region	Australia
Reference	Buchtmann, L. (2000). Digital songlines: The use of modern communication technology by an Aboriginal community in remote Australia. *Prometheus*,*18*(1), 59-74.
Abstract	In the mid-1980s the AUSSAT satellite brought television and radio to remote Australia for the first time. There was concern amongst Aboriginal communities that the imposition of mass media without consultation could result in permanent damage to culture and language. However, over the years, the Warlpiri people have adopted modern communication technology including radio, video making, locally produced television, and more recently on-line services. This paper examines why the Warlpiri have adopted modern communication technology and whether there have been social changes as a result. It also looks at the pioneering media work by the Pitjantjatjara people at Ernabella in the far north of South Australia.

Title:	**How women in remote and rural First Nation communities are using Information and Communications Technologies (ICT)**
Author	Penny Carpenter, Kerri Gibson, Crystal Kakekaspan, & Susan O'Donnell
Region	Canada
Reference	Carpenter, P., Gibson, K., Kakekaspan, C., O'Donnell, S., & Ramsey, D. (2013). How women in remote and rural First Nation communities are using information and communications technologies (ICT). *The Journal of Rural and Community Development, 8*, 79-97.
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.

Title:	**Technology in Language Use, Language Teaching, and Language Learning**
Author	Dorothy Chun, Richard Kern, and Bryan Smith
Region	USA
Reference	Chun, D. Kern, R. & Smith, B. (2016). Technology in language use, language teaching, and language learning. *The Modern Language Journal*, 100, 64–80.
Abstract	This article offers a capacious view of technology to suggest broad principles relating

	technology and language use, language teaching, and language learning. The first part of the article considers some of the ways that technological media influence contexts and forms of expression and communication. In the second part, a set of heuristic questions is proposed to help guide language teachers and researchers in determining how to incorporate technology into their teaching practice or research agenda and evaluate its suitability and impact. These questions are based primarily on the goal of helping learners to pay critical attention to the culturally encoded connections among forms, contexts, meanings, and ideologies that they will encounter and produce in different mediums, both traditional and new.

Title:	The Digital Divide: A Global and National Call to Action
Author	Rowena Cullen
Region	New Zealand, USA, UK
Reference	Cullen, R. (2003). The digital divide: a global and national call to action. *The Electronic Library*, *21*(3), 247-257.
Abstract	The phrase "digital divide" has been applied to the gap that exists in most countries between those with ready access to the tools of information and communication technologies (ICTs), and those without such access or skills. This may be because of socio-economic or geographical factors, educational, attitudinal and generational factors, or because of physical disabilities. The paper reviews recent research concerning the digital divide in New Zealand, and the factors that alienate people from enjoying the benefits of information technology and participation in the knowledge economy. While socio-economic factors affect use of ICTs by urban Maori and Pacific Island communities, and rural communities are affected by inadequate telecommunications infrastructure, rural Maori are even more disadvantaged. The paper examines strategies used in the USA and the UK at national and regional levels to address similar issues, including the use of libraries to reduce the digital divide, and compares these with New Zealand initiatives, to identify positive means of increasing participation in the knowledge economy.

Title:	Developing Intermediate Language Learning Materials: A Labrador Inuttitut Story Database
Author	Joan Dicker, Ewan Dunbar, and Alana Johns
Region	Canada
Reference	Dicker, J., Dunbar, E., Johns, A. (2009). Developing intermediate language learning materials: A Labrador Inuttitut story database. In Reyhnar, J. & Lockard, L. (Eds), *Indigenous language revitalization encouragement, guidance and lessons learned* (pp. 155- 166). Flagstaff, AZ: Northern Arizona University.
Abstract	This paper describes the collaboration between two linguists and a public school language teacher in the making of a story database for use in the second language learning of Labrador Inuttitut in Canada. First, we describe the process through which the collaboration took place. Linguists who are working with communities have linguistic goals, and communities have long-term language teaching goals. Where the two goals intersect, it is possible to have mutually useful collaboration. One of the challenges is to determine whether or not there is indeed intersection of goals so that precious time and effort is not wasted. Next, we describe the development of a story database that has the properties that we believe are optimal for intermediate language learners. It will have a large amount of original Inuktitut data and will also have extra information for learners that is hidden from view unless the learner chooses to look at it. We believe that Internet story publishing is faster, cheaper and can reach a larger audience than traditional publishing. It can also have more innovative aspects such as audio and optional help, which is ideal for the intermediate learner, who will then control the level and speed of the information. Naturally, it also has limitations. It depends on access to expensive equipment, it can't be taken out on the land and the length of time that such materials will be available is usually unknown.

Title:	Can Information Communication Technological Tools be Used to Suit Aboriginal Learning Pedagogies?
Author	Michael Donovan
Region	Australia
Reference	Donovan, M., (2007) 'Can Information Communication Technological Tools Be Used to Suit Aboriginal Learning Pedagogies' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people*. Hershey PA: Information Science Pub. (p. 93 - 104)
Abstract	Indigenous peoples are some of the most disadvantaged groups globally; Australian aboriginals and Torres Strait Islander communities are no different. Much of their lack of success can be related to the inappropriate educational practices directed at them through non-indigenous pedagogical filters of the Australian educational systems. There is a need for some pedagogical change to suit the needs and learning pedagogies of aboriginal and Torres Strait Islander students. By accessing information communication technologies (ICT), aboriginal and Torres Strait Islanders communities can improve their educational outcomes. They can design education programs with aboriginal pedagogies at the forefront to suit their needs using ICT. Outcamp ICT learning centres, placed where aboriginal communities can gain easy access to them and staffed with educators who can help facilitate the development of learning skills, are one solution to improving educational achievement

Title:	Cultural Issues in the Adoption of Information and Communication Technologies by Indigenous Australians
Author	Laurel Evelyn Dyson
Region	Australia
Reference	Dyson, L. E. (2004). Cultural issues in the adoption of information and communication technologies by Indigenous Australians. In Proceedings cultural attitudes towards communication and technology (pp. 58-71). Perth: Murdoch University. Chicago
Abstract	This paper investigates cultural issues concerning Information and Communication Technologies (ICTs) and Indigenous Australians. Firstly, it examines whether the low adoption of ICTs by Indigenous Australians derives from a rejection of Western values embodied in the technology. A review of the existing literature shows no evidence for this. Instead, there appears to be an overwhelmingly enthusiastic response, limited only by a difficulty in accessing the technology due to cost, isolation, poor telecommunications infrastructure and low computer skills. Secondly, the paper looks at how ICTs can be implemented to reflect particular Indigenous Australian cultural concerns. Contrary to the view of the technological pessimists, who see computers as a vehicle for marginalizing non-Western cultures, ICTs are shown to be adaptable to other cultures, especially once people from that culture have input into ICT design and management. A number of examples of how this is being done in practice are given.

Title:	Language Revitalization and New Technologies: Cultures of Electronic Mediation and the Refiguring of Communities
Author	Patrick Eisenlohr
Region	USA
Reference	Eisenlohr, P. (2004). Language revitalization and new technologies: Cultures of electronic mediation and the refiguring of communities. *Annual Review of Anthropology*, 21-45.
Abstract	Recently, language activists and linguists have begun new technologies in projects aimed at revitalizing the practice of lesser-used languages. This review explores related work, emphasizing how practices of electronic mediation enabled by such technologies both shape and are informed by linguistic ideologies, which in turn crucially influence the possible revived use or abandonment of linguistic varieties. New technologies are treated as part of cultures of electronic mediation, connecting sociocultural valuations to mediated discourse. Their use often has important political implications, given that projects of language

	revitalization are often linked to claims of ethnolinguistic recognition. Finally, because documentation of lesser-used languages using digital technologies also results in the production of new cultural objects to be stored, displayed and circulated, attention is also focus on the forms of sociality sustained by the creation and exchange of such electronic artifacts.

Title:	**Empowering Indigenous Learners in Remote Australian Communities**
Author	Alison Elliott
Region	Australia
Reference	Elliott, A. (2009). Empowering indigenous learners in remote Australian communities. Paper presented at the *Refereed Paper CIRN Community Informatics Conference*
Abstract	Remote schools in predominantly Indigenous (Australian) towns and communities are confronted by staffing challenges unimaginable in urban areas. Ideally, remote schools should be staffed largely by teachers who have strong social and cultural ties to their communities and who want to live and work in them. However, for a range of complex cultural, social and economic reasons, many Indigenous people living in remote Australia who would make excellent teachers are not in the position to participate in mainstream higher education programs to qualify as teachers, nor are they able to participate in regular external studies or 'open' learning programs because of limited ICT access and skills and other social and communication challenges. This paper outlines the pedagogical underpinnings of Growing our Own and particularly, ways in which community informatics are used to empower learning. Growing our Own addresses the long standing problem of engaging remote Indigenous learners in higher education, and in the longer term, building sustainable, Indigenous teaching workforces by delivering teacher education in situ in remote Northern Territory communities. Growing Our Own is a partnership between Charles Darwin University and Catholic Education Northern Territory. The program is delivered 'in-place' and empowers students by valuing and actively embracing cultural knowledge as it builds relevant ways of knowing and doing 'schooling' to meet the graduate professional standards for teacher registration in the Northern Territory. All students are employed as Teacher Assistants. Growing Our Own employs one-to-one and small group tutoring along with digital technologies to personalise learning, build learning communities, provide access to the wider world of education, teaching and learning and build on students' cultural knowledges and existing teaching skills. Simultaneously, digital tools are used to support academic staff and co-teachers enrich their understandings of local Indigenous cultures and blend local ways of knowing, being and doing with contemporary "school" knowledge. This 'two ways' approach infuses local cultural knowledges across all aspects of the program to empower learning. Its culturally responsive focus values Indigenous educators' strong sense of cultural identity and learning styles including collaborative work. Importantly, digital technologies are instrumental in scaffolding personalised learning approaches, including assessment, that empower students and the wider community to calibrate personal and local knowledges with mainstream curriculum knowledge and effective teaching strategies.

Title:	**The Aboriginal Invention of Broadband: How Yarnagu are using ICTs in the Ngaanyatjarra Lands of Western Australia**
Author	Daniel Featherstone
Region	Australia
Reference	Featherstone, D. (2013). The Aboriginal invention of broadband: How yarnangu are using ICTs in the ngaanyatjarra lands of western Australia. *Information Technology and Indigenous Communities*, 27-52.
Abstract	This chapter describes how the remote Indigenous media organisation Ngaanyatjarra Media has supported community access to information and communications technologies (ICTs), and the ways in which Yarnangu, the Ngaanyatjarra people, have engaged in locally relevant

	uses for creative expression, learning, communication, and language and cultural maintenance. I present observations by Yarnangu and others of the outcomes of a range of ICT programs that have been delivered by Ngaanyatjarra Media to communities in the region since 2004. My participatory action research approach is based on nine years of working collaboratively with Yarnangu in all aspects of planning, delivery and assessment of these programs. The chapter outlines the approach taken, outcomes and community uptake, lessons learned and possible futures for remote ICT applications. The ICT programs undertaken in the Ngaanyatjarra region have resulted in active engagement by Yarnangu. Young people are early and fearless adopters of these new technologies, but older people are also using ICTs to access digital heritage archives, entertainment and relevant online services. Although it is too early to assess the continuity of skills development and future usage of ICTs, this early uptake shows that the Ngaanyatjarra Media approach to ICT training and access could be a workable model for delivery in other remote Indigenous regions.

Title:	The K-Net Development Process: A Model for First Nations Broadband Community Networks
Author	Adam Fiser, Andrew Clement, Brian Walmark
Region	Canada
Reference	Fiser, A., Clement, A., and Walmark, B. (2006). The K-net development process: A model for First Nations broadband community networks. CRACIN Working Paper No. 12, Toronto: Canadian Research Alliance for Community Innovation and Networking.
Abstract	The Kuh-ke-nah Network (K-Net) is a community network that currently comprises 60 First Nations communities across Ontario, and Quebec, Canada. K-Net Services is the telecom and ICT arm of Keewaytinook Okimakanak Tribal Council (the Northern Chiefs), an organization located in northwestern Ontario that brought the original vision of K-Net to life amongst the Tribal Council's six member communities in the mid 1990's. This paper traces the evolutionary trajectory of K-Net development and examines the advantages and drawbacks to the emerging model of telecom service provision in which K-Net is a pioneering exemplar. First, it chronologically charts the expanding set of relationships among the heterogeneous key actors across the public, private and civil sectors. Then it reviews the contemporary situation of K-Net, how the combination of such vital factors as community ownership/control, bandwidth aggregation and dynamic allocation, local (ICT) skills development, and social-needs orientation interact with each other and are operationalized within this network of relations. Finally, the paper draws some preliminary conclusions about the principles and viability of this model, likely future development, and the prospect that it offers a workable model for other community networking initiatives, especially in traditionally underserved areas.

Title:	The Digital Dreamtime: A Shining Light in the Culture War
Author	Jenny Fraser
Region	Australia
Reference	Fraser, J. (2012) *The digital dreamtime: A shining light in the culture war.* Te Kaharoa, 5. pp. 105-114
Abstract	The realm of the arts is often viewed as the stronghold in the last line of defence against the enduring colonisation process of the minority Aboriginal populace. It is one of few avenues in Australian society where Aboriginal people can have a voice and fortunately this is partly driven by the influence of the outside international artworld. In more recent years the digital production areas have further enabled the space and recognition for self-determined, culturally specific and diverse sources of creativity, exchange and community building. This is all despite a culture war where mainstream institutions such as the galleries sector, the associated funding bodies, academia and the media are all being utilised and strengthened as non-military mechanisms of imperialism.

Title:	**Multimedia Technology and Indigenous Language Revitalization: Practical Educational Tools and Applications Used Within Native Communities**
Author	Candace Galla
Region	USA
Reference	Galla, C. K. (2010). Multimedia technology and indigenous language revitalization: Practical educational tools and applications used within native communities. Doctoral Thesis. The University of Arizona. 271. Retrieved on August 28, 2016 from http://arizona.openrepository.com/arizona/bitstream/10150/195833/1/azu_etd_11213_sip1_m.pdf
Abstract	This dissertation reports findings from a study documenting the use of multimedia technology among Indigenous language communities to assist language learners, speakers, instructors, and institutions learn about multimedia technologies that have contributed to Indigenous language revitalization, education, documentation, preservation, and maintenance. The overall study used an adapted technacy framework to investigate how Indigenous language advocates holistically understand, skillfully apply and communicate creative and balanced technological solutions that are based on understanding of contextual factors (Seemann & Talbot, 1995). The research presented is based on a survey of individuals who used technology for Indigenous language revitalization purposes, as well as on case studies of students of the American Indian Language Development Institute (AILDI) who enrolled in the technology course, "Computer Applications for Indigenous Language Communities". The survey provided an overview of the types of technologies Indigenous communities are using for the revitalization of their language. In the study, case studies were also conducted to provide an in-depth understanding of where, when, why, and how users are implementing these technologies in their home, communities, and schools. Research questions, participants, and data collection were organized and analyzed according to three levels: multimedia technology use among Indigenous language communities, Indigenous language institutes and technology training, and AILDI student case studies. Many Indigenous communities are facing language endangerment and extinction and are looking for ways to preserve, document, revitalize and maintain their languages. One way is the integration of technology. Findings from the study suggest that the language goals of the community need to be determined prior to the incorporation of technology in these efforts. The study also found that regardless of the size of the community, opportunities for using technology in Indigenous language revitalization efforts were shaped by literacy and oral proficiency of the community, as well as linguistic and cultural, social, economic, environmental, and technological factors as expressed in the adapted technacy model. Overall, the study underscored the importance of taking context into consideration in order to make grounded choices about technology as a component of contemporary language revitalization efforts.

Title:	**Sustaining Generations of Indigenous Voices: Reclaiming Language and Integrating Multimedia Technology**
Author	Candace Galla
Region	USA
Reference	Galla, C.K. (2012). Sustaining generations of Indigenous voices: Reclaiming language and integrating multimedia technology. *World Indigenous Nations Higher Education Consortium Journal*, 1, 59-67.
Abstract	Today, there are approximately 7,000 languages spoken throughout the world, each varying in size from hundreds of millions of speakers to languages with all but a few speakers remaining. Nearly 97% of the world's people speak 4% of the world's languages, which includes English, Mandarin, Hindi, Spanish, Arabic, and German, among others. Conversely, approximately 96% of the world's languages are spoken by 3% of the world's people (Bernard, 1996, p. 142). It is estimated by 2100, more than half of the languages currently spoken will disappear. Some of these languages have not yet been documented, and if these languages cease to exist, a "wealth of knowledge about history, culture, the natural environment, and the human brain" (National Geographic Society, 2009) will be lost. For many Indigenous

	language communities and language learners, a general topic of concern in today's society is how technology can contribute to language revitalization. This subject provokes discussions resulting in a dynamic that at times may be very challenging. At one end of the spectrum, it is common to see younger generations using technologies of all sorts, and communicating in ways that were unavailable to the world ten or more years ago; this includes texting, blogging, chatting, tweeting, and so forth. However, at the opposite end of the spectrum, it is common to presume little or no use of the latest technologies by Elders.

Title:	Indigenous Language Revitalization, Promotion, and Education: Function of Digital Technology
Author	Candace Galla
Region	US
Reference	Galla, C.K. (2016). Indigenous language revitalization, promotion, and education: function of digital technology. Computer Assisted Language Learning. April. Retrieved on August 28, 2016 from http://dx.doi.org/10.1080/09588221.2016.1166137
Abstract	Within the last two decades, there has been increased interest in how technology supports Indigenous language revitalization and reclamation efforts. This paper considers the effect technology has on Indigenous language learning and teaching, while conceptualizing how language educators, speakers, learners, and technology users holistically understand, skillfully apply and communicate creative and balanced technological solutions that are based on understanding of contextual factors. A total of 80 participants representing at least 47 Indigenous languages completed a survey in 2009 representing individuals, organizations, and institutions that serve one or more Indigenous language communities across the United States, Canada, Australia, New Zealand, Taiwan, Guatemala, Peru, Greenland, Mexico, Bolivia, French Polynesia (Marquesas Islands and Tuamotu Islands), and Russia. The data reveal the functions digital technology has in Indigenous language revitalization, which include (1) positive and supportive roles (2) concerns, constraints, and tensions, and (3) Indigenous language education. Regardless of the size of the community, opportunities for using technology in Indigenous language revitalization efforts are shaped by linguistic, cultural, social, economic, environmental, and technological factors as expressed in the technacy framework for language revitalization. Findings indicate that technology has wide and mostly positive applications in language learning and teaching, that the benefits of those applications remain consistent across communities regardless of size and geographic location, and that new and innovative uses of technology are being adopted to support language revitalization efforts. Overall, the study underscores the importance of context in making grounded decisions about technology as a component of contemporary language revitalization efforts.

Title:	Indigenous Language Revitalization and Technology from Traditional to Contemporary Domains
Author	Candace K. Galla
Region	USA
Reference	Galla, C. (2009). Indigenous language revitalization and technology from traditional to contemporary domains. In Reyhnar, J. & Lockard, L. (Eds), *Indigenous language revitalization encouragement, guidance and lessons learned* (pp. 167- 182). Flagstaff, AZ: Northern Arizona University.
Abstract	This paper describes critical areas in which technology plays a role in language and culture revitalization and explores efforts made by Indigenous communities to preserve, maintain and revitalize their Indigenous language with the help of computer technology. People are interested in both traditional and contemporary culture and are finding new ways to practice and preserve their cultural heritage. One way includes the use of computerized and digital multimedia technologies. (Scott, 2007, p. 138)

Title:	Nikma'jtut Apoqnmatultinej: Reclaiming Indigeneity via ancestral wisdom and new ways of thinking
Author	Christopher T. George
Region	Canada
Reference	George, C. (2015) Nikma'jtut apoqnmatultinej: Reclaiming indigeneity via ancestral wisdom and new ways of thinking. Canadian Sociological Association, University of Ottawa, June.
Abstract	Settler colonialism continues to marginalize and threaten Indigenous epistemology, languages and ways of knowing. This eight-week auto-ethnographic study details my use of Information and Communication Technology (ICT) to deconstruct the epistemological and ontological perspectives I have acquired during my lived experience immersed in settler society. My hope is to gain better insight into Mi'gmaw worldview through an introspective journey to learn my mother's language thus my own cultural identity.

Title:	Communication Technologies for Focus Groups with Remote Communities: A Case Study of Research with First Nations in Canada
Author	Marie-France Gratton, Susan O'Donnell
Region	Canada
Reference	Gratton, M.F., O'Donnell, S. (2011). Communication technologies for focus groups with remote communities: A case study of research with First Nations in Canada. *Qualitative Research*, 11(2), 159-175.
Abstract	Communication technologies offer qualitative researchers more options for conducting research with remote communities. It is not always possible for researchers to travel to conduct focus groups and interviews in person, especially when travel is prohibitively time-consuming and expensive. This reason is often given to explain the lack of qualitative research with participants living in remote First Nations (Aboriginal) communities in Canada. This manuscript presents a case study of a research method developed in collaboration with our research partner K-Net and KORI (Keewaytinook Okimakanak) in northwestern Ontario. The specific study investigated preferences for online health information for First Nations people living in remote communities. Working with K-Net, we developed a method to use multi-site videoconferencing for focus groups — live visual and audio exchange between the researcher in Ottawa and participants in multiple remote First Nations communities. Our conclusion encourages other researchers to try this innovative method to include more remote First Nations community members in participatory research projects.

Title:	Mishkeegogamang Tepacimowin Networks
Author	Connie Gray-McKay, Kerri Gibson, Susan O'Donnell
Region	Canada
Reference	Gray-McKay, C., Gibson, K., & O'Donnell, S. (2014). Mishkeegogamang tepacimowin networks. *The Journal of Community Informatics, 10*(1)
Abstract	Mishkeegogamang First Nation is a rural Ojibway community in Northwestern Ontario. Mishkeegogamang community members of all ages use a wide array of information and communication technologies (ICT) as tools in daily life, and as a means to support individual and community goals. This collaborative paper tells the story of how Mishkeegogamang uses ICT for community development, drawing on 17 interviews with community members, and several community member profiles. A basic descriptive quantitative analysis is also provided, giving information on frequency of use of a wide variety of technologies. The research discussed in this paper takes a community informatics approach (Gurstein, 2003). Community informatics sees Mishkeegogamang's digital infrastructure, technology and services as potential tools for community development and social benefit. Community informatics theory suggests that the introduction and use of ICT into Mishkeegogamang offers the community more capacity for independence, resistance, and social, cultural or economic activities. A broad range of ICT use by community members will be explored,

	including the Mishkeegogamang website, the busy yet invisible use of social networking sites, youth and ICT, ICT for health and education, and ICT to support traditional activities. Finally, a section on challenges and needs for facilitating ICT use is also provided.

Title:	**Making the Most of Technologies for Learning in Remote Context**
Author	John Guenther, Eva McRae-Williams
Region	Australia
Reference	Guenther, J., & McRae-Williams, E. (2011). Making the most of technologies for learning in remote context. *VOCAL: The Australian Journal of Vocational Education and Training in School*, 9, 88.
Abstract	This article, based on a Cooperative Research Centre for Remote Economic Participation (CRC-REP) research project - 'Pathways to Employment' - will canvas the proposition that mobile technology can be used as an effective vehicle for vocational learning in remote Australian communities. This proposition in itself is not new and indeed there are a number of examples in the literature that demonstrate the possibilities of mobile and emerging ICT technologies in remote Aboriginal and Torres Strait Islander communities in Australia and indigenous communities elsewhere in the world. However, the application of technologies in vocational learning is often applied to the delivery of mainstream training packages for mainstream employment outcomes. Further, the development of new technologies and 'apps' that go with them is changing at such a pace that past work in this field is fast becoming dated. The 'Pathways to Employment' research project considers pathways from a different starting point than many other research projects, which take as a given, the traditional notion of pathways to employment - typically linear, mainstream oriented and driven - with all the mainstream assumptions that go along with this notion of 'pathway'. The paper will focus on the opportunities presented by a relatively rapid uptake of mobile phone technology (in particular smartphones) and other information and communication technologies in remote communities for vocational learning that bases itself on Aboriginal and Torres Strait Islander standpoints. The challenge for VET practitioners presented in the discussion of the article is to build VET teaching and learning practice on a foundation of Aboriginal and Torres Strait Islander ways of being, knowing, valuing and doing. There is a temptation for trainers and assessors to consider pragmatic approaches of applying technologies to required competencies. Instead, the authors argue here that this should be secondary to the need for approaches using e-learning or m-learning to be grounded in learners' ontologies, epistemologies, axiologies and even cosmologies. On the surface this sounds like an academic exercise, but the authors argue that this approach is more likely to be effective, and further, it is doable for VET trainers working cross-culturally in remote parts of Australia.

Title:	**Language, Identity, and Community Control: The Tagish First Voices Project**
Author	Kate Hennessy, Patrick J. Moore
Region	Canada
Reference	Hennessy, K., & Moore, P. J., (2007) Language, Identity, and Community Control: The Tagish First Voices Project in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people*. Hershey PA: Information Science Pub (p. 189 - 191)
Abstract	To all my children, we are losing our language. You are our future leaders; you must learn our language. It is the root and heart of our culture. I pass you our language. You must learn our language. — "A Message to our Children," Tagish First Voices Web site. From the turn of the century into the early 1970s, the Choutla Anglican residential school at Carcross in the Yukon Territory was home to generations of Tagish and Tlingit children. Victims of an assimilationist educational ideology that separated them from their families for at least ten months of the year, many children were denied the teachings of their Elders, the right to speak their native language and, as a result, many aspects of their identity as native people. The Tagish and Tlingit community at Carcross has since come to terms with the pain and

	loss associated with the Choutla school and has become empowered to move beyond the extreme paternalism of the residential school era to greater self-determination and a deep sense of cultural identity. It is symbolic that in the very place where the native languages were aggressively decimated by the residential school policies, members of the local community are taking control of information technology to ensure the revival of the Tagish language. Control over technology has in this case facilitated the assertion of authority over every way their language is represented and made it possible for their cultural values and practices to define the nature of such representations.

Title:	**Indigenous Language Revitalization and Documentation in the United States: Collaboration Despite Colonialism**
Author	Mary Hermes
Region	USA
Reference	Hermes, M. (2012). Indigenous language revitalization and documentation in the United States: Collaboration despite colonialism. *Language and Linguistics Compass*, *6*(3), 131-142.
Abstract	In this article, Hermes brings together literature from disparate areas to give a perspective of indigenous language revitalization and documentation efforts in the United States as situated in the context of global revitalization. Much of the narrative surrounding indigenous languages has been dominated by the idea of language death. In stark contrast to the picture of impending doom, the author brings attention to long-standing efforts of change characterized by community building and collaboration with academics across disciplines, cultures, and ideologies. In this narrative of change, indigenous languages are central to a sustainable future rather than relics from a dying past

Title:	**New Domains for Indigenous Language Acquisition and Use in the USA and Canada**
Author	Mary Hermes, Phil Cash, Keola Donaghy, Joseph Erb, and Susan Penfield
Region	Canada, USA
Reference	Hermes, M., Cash, P., Donaghy, K., Erb, J., Penfield, S. (2016) New domains for Indigenous language acquisition and use in the USA and Canada, in Eds. Coronel-Molina, S. & McCarty, T.L. *Indigenous Language Revitalization in the Americas*. New York, NY: Routledge. (p. 269-290)
Abstract	In our intelligent and passionate efforts to revitalize our Indigenous languages, we are appropriating technological tools in intended, unintended, and newly imagined ways. This chapter descries some of these efforts. As a group of geographically dispersed scholars, we met virtually to think collectively about ways to categorize this unfolding of events, the technological revolution, as experienced in revitalization. We think of it in ways that we hope are helpful to readers also trying to make sense of this experience. We address these categories: (1) the first steps to enable technology to be useful to the language; (2) using technology to communicate; (3) using technology to learn or teach; and (4) using technology for documentation and preservation. After first writing about the principles and ideas in these areas, we then animate and collapse our categories with site-specific examples. Hawaiian, Cherokee, Ojibwe, and Mohave languages are discussed from our vantage point of experience working to revitalize these languages.

Title:	**Indigenous Digital Storytelling in Video: Witnessing with Alma Desjarlais**
Author	Judy M. Iseke
Region	Canada
Reference	Iseke, J. M. (2011). Indigenous digital storytelling in video: Witnessing with Alma Desjarlais. *Equity & Excellence in Education*, 44(3), 311-329. Chicago
Abstract	Indigenous digital storytelling in video is a way of witnessing the stories of Indigenous communities and Elders, including what has happened and is happening in the lives and work of Indigenous peoples. Witnessing includes acts of remembrance in which we look back to reinterpret and recreate our relationship to the past in order to understand the

	present. Pedagogical witnessing allows my reading, viewing, or listening to be an event in which I allow the understanding of someone else's life to interrupt my own life. This article begins with a discussion of a digital storytelling video project in which an Indigenous Elder, Alma Desjarlais—a Cree/Métis grandmother—shares stories to witness and help us understand the histories of trauma and the resilience and strength of Indigenous peoples. Her stories are interspersed from the film, Grandmothers of the Métis Nation (Iseke, 2010a; to view a trailer for the film see http://www.ourElderstories.com) that is part of the digital storytelling project and provides supplementary background information to support the social, political, cultural, and economic context of the stories. Alma's stories are followed by a discussion of witnessing and the ways that Indigenous digital storytelling, through the digital storytelling project with Alma Desjarlais, involve pedagogic witnessing.

Title:	**Learning te Reo Maori via Online Distance Education: A Case Study**
Author	Maree Jeurissen
Region	New Zealand
Reference	Jeurissen, Maree. (2015) Learning te reo Māori via online distance education: A case study. *Journal of Open Flexible and Distance Learning* 19.1: 45-62.
Abstract	Despite some gains in the regeneration of te reo Māori, the indigenous language of Aotearoa New Zealand, its long-term survival remains threatened. One avenue for regeneration seldom considered is the English-medium secondary school. This article reports on a case study where students in one such school chose te reo Māori as an option and, and, because no face-to-face teacher was available, opted to continue via online distance education. Their experience over a year was documented and analysed through the lens of Willems' (2012) quadripartite model of resilience. Despite high levels of motivation, the students encountered considerable difficulties from which educators and education policy makers can learn important lessons.

Title:	**The Use of Digital Technology in the Preservation of Māori Song**
Author	Rachael Ka'ai-Mahuta
Region	New Zealand
Reference	Ka'ai-Mahuta, R. (2012) The use of digital technology in the preservation of Māori song. *Te Kaharoa* 5.1
Abstract	This paper will focus on the importance of digitally archiving waiata and haka (Māori song, chant and dance). Māori arrived in Aotearoa from their traditional homeland in the Pacific carrying with them all of the knowledge of their own ancestors, none of which was written down. This Māori oral tradition has taken on many forms, including waiata and haka. Waiata and haka are traditional mediums for the transmission of knowledge including tribal history, politics, historical landmarks, genealogy and environmental knowledge while also acting as traditional forms of expression for the articulation of anger, hatred, sadness, love and desire. Waiata and haka are examples of Māori poetry and literature and have been likened to the archives of the Māori people, preserving important historical and cultural knowledge. Therefore, waiata and haka offer an alternative view of the history of Aotearoa/New Zealand to those that are based on mainstream Eurocentric history books and archives. Waiata and haka are also important for the survival of the Māori language and culture. In this sense, they are bound to Māori identity. As a result of colonisation many of these compositions are being lost through time and with them, a knowledge base regarding the meaning behind the words. The adoption of digital technology to preserve waiata and haka provides a tool that could aid the oral tradition. Tāmata Toiere, a digital repository of waiata and haka, is a national resource which demonstrates the interface between recovering traditional knowledge and storing this through innovative technology for future generations.

Title:	**Incorporating Technology into a Hawaiian Language Curriculum**
Author	Makalapua Ka'awa, Emily Hawkins
Region	USA
Reference	Ka'awa, M. & Hawkins, E. Incorporating Technology into a Hawaiian Language Curriculum. Presented at Incorporating Technology into a Hawaiian Language Curriculum. Available at http://eric.ed.gov/?id=ED415072
Abstract	This paper describes Hawaiian language courses that incorporate computer technology at the University of Hawaii at Manoa. In the past decade, enrollments in all types of Hawaiian language programs have increased rapidly. The University of Hawaii is committed to extending Hawaiian language education, especially the full development of Hawaiian immersion in the K-12 educational system. The University trains teachers, conducts program evaluations, prepares materials and textbooks, advises on language policy, is a continuing source of Hawaiian speakers, and provides venues for language use. Technology is a tool to involve students and community members in learning and using Hawaiian. Technologies used include the Hawaii Interactive Television System (HITS), four distance-learning channels linking the major Hawaiian islands; e-mail; and software to promote the writing process and for creating World Wide Web pages. Hawaiian language courses and their technology-mediated activities include: (1) a writing-intensive intermediate course in Hawaiian in which students engage in e-mail and live computer-based discussion groups; (2) an advanced course delivered via HITS, primarily to Hawaiian immersion teachers on four islands; (3) integrated technology training and Hawaiian language learning that enables students to provide technology training off-campus to the Hawaiian language community; and (4) a course on development of thematic multimedia curriculum units for immersion programs. Other projects include a website on Hawaiian birds and a Hawaiian language newspaper project for immersion students in grades 6-10. Eight websites with Hawaiian language resources are listed. (SV)

Title:	**The First Mile Approach to Community Services in Fort Severn First Nation**
Author	Matthew Kakekaspan, Susan O'Donnell, Brian Beaton, Brian Walmark, Kerri Gibson
Region	Canada
Reference	Kakekaspan, M., O'Donnell, S., Beaton, B., Walmark, B., & Gibson, K. (2014). The first mile approach to community services in Fort Severn First Nation. *The Journal of Community Informatics, 10*(2)
Abstract	Fort Severn Washaho Cree Nation is a small, remote northern community on the Severn River near Hudson Bay in Ontario. The community services delivered in Fort Severn are managed and controlled by the local leadership, working in collaboration with their regional tribal council Keewaytinook Okimakanak and other strategic partners. The First Mile is both an emerging policy approach and a framework that supports holistic and community-centred broadband development and use by First Nations. First Mile focuses on community management and control of local broadband infrastructure and services. The paper discusses how Fort Severn First Nation is putting First Mile concepts into action.

Title:	**Te Mata o te Tai – The Edge of the Tide: Rising Capacity in Information Technology of Maori in Aotearoa, New Zealand**
Author	Robyn Kamira
Region	New Zealand
Reference	Kamira, R. (2003). Te Mata o te Tai-the edge of the tide: rising capacity in information technology of Maori in Aotearoa-New Zealand. *The Electronic Library*, 21(5), 465-475.
Abstract	This paper argues that one can extract relevant lessons in the information technology era from one's colonial past. One such lesson is to understand how information technologies might further impact on one's knowledge. While there are many recent information technology projects, they are often ad hoc and in "pilot" or "trial" mode, reducing any chance of sustainability or "proof of concept". However, experience has taught people some of the

	pitfalls, management and effectiveness of information technology, and the capacity to understand, select and critique is increasing. Thus, the edge of the tide creeps slowly forward.

Title:	**Cultural Hybridity, Resilience and the Communication of Contemporary Cherokee Culture through Mobile Technologies**
Author	Kevin R. Kemper
Region	USA
Reference	Kemper, K. R., (2016) 'Cultural Hybridity, Resilience and the Communication of Contemporary Cherokee Culture through Mobile Technologies' in *Indigenous People and Mobile Technologies*, Taylor & Francis, New York, NY. (p. 239-252)
Abstract	The Cherokee had developed a syllabary to express language in written form, but modern developments show this syllabary spreading through all kinds of technologies. This chapter provides an ideological critique of expressions of that syllabary in mobile technologies. The thesis is straightforward - there is an ideology of contemporary Cherokee culture that insists that the self spaces of original Cherokee culture should be infused unto shared spaces like technology innovations to help Cherokee culture to persevere and thrive. this chapter is somewhat similar to Roy Boney, Jr.'s discussion of "Cherokeespace.com" or how he uses new technologies to combat stereotypes about Cherokee people and culture (Boney 2012, 222). However, this chapter extends Boney's work from an ideological perspective and situates the practical within the theoretical. we need conceptual clarity as to why the Cherokee are doing what they are doing and then how we view and engage with that.

Title:	**The Pedagogical Potential of Multimedia Dictionaries Lessons from a Community Dictionary Project**
Author	Haley De Korne & The Burt Lake Band of Ottawa and Chippewa Indians
Region	Canada
Reference	DeKorne, H. (2009). The pedagogical potential of multimedia dictionaries lessons from a community dictionary project. In Reyhnar, J. & Lockard, L. (Eds), *Indigenous language revitalization encouragement, guidance and lessons learned* (pp. 142- 153). Flagstaff, AZ: Northern Arizona University.
Abstract	Although traditionally used as a documentation device, dictionaries are being reconceived and explored for pedagogical potential through the use of multimedia technology. This paper looks at some considerations for creating a dictionary aimed at facilitating Indigenous language acquisition, including the possibilities and limitations of multimedia, educational approaches and the needs of Heritage language learners. Through a case study of the Burt Lake Band of Ottawa and Chippewa Indian's bilingual Anishinaabemowin dictionary project, some specific approaches to enhancing the educational potential of a multimedia dictionary and future directions are discussed.

Title:	**The Acquisition of Media as Cultural Practice: Remote Indigenous Youth and New Digital Technologies**
Author	Inge Kral
Region	Australia
Reference	Kral, I. (2013). The acquisition of media as cultural practice: Remote indigenous youth and new digital technologies. Dyson, L., Hendriks, M and Grant, S. (eds) *Information Technology and Indigenous Communities,* 53-73.
Abstract	Globally, telecommunications, information technologies and traditional broadcast media have converged into a digital realm. In remote Indigenous Australia, with improved broadband and greater access to mobile telephony and digital technologies through media organisations, arts projects and libraries, young people are appropriating new digital technologies for their own socio-cultural processes and purposes. In the remote context, the affordances of digital technology are enabling individual and collective access and

	participation, the acquisition of expertise, and the enhanced capacity for computer-mediated communication and multimodal production outside institutional or instructional settings. The manner in which young people are taking up digital technology reveals much about the way in which their imaginative capacities are being moulded by them and how this technology is being used as a cultural tool. In this chapter, a 'practice' perspective is taken from anthropology to highlight how the digital media practices of Indigenous youth in some communities are drawn from the established practices of the older generation, who, from the 1970s, participated in remote Indigenous media organisations and used earlier pre-digital media forms as tools for language and culture maintenance.

Title:	**Digital Songlines: Digitising the Arts, Culture and Heritage Landscape of Aboriginal Australia**
Author	Brett Leavy
Region	Australia
Reference	Leavy, B., (2007) 'Digital Songlines: Digitising the Arts, Culture and Heritage Landscape of Aboriginal Australia' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people*. Hershey PA: Information Science Pub (p. 159 - 169)
Abstract	Digital Songlines is a software toolkit being developed by the Australasian Cooperative Research Centre for Interaction Design. It consists of an applied set of protocols, methodologies and a software program for the collection and sharing of indigenous cultural heritage knowledge. Regular consultation with indigenous traditional owners and representative groups is an essential component of the development process. This article provides an overview of the components of the Digital Songlines toolkit, and illustrates the development of the cultural heritage system in its current prototype. The system employs virtual reality tools to enable aboriginal communities to digitally preserve, protect and promote their arts, culture and heritage. The 3-D visualisation will allow users to appreciate the land as central to the culture, stories and lives of indigenous peoples.

Title:	**Information and Communication Technology for Education in an Algonquin First Nation in Quebec**
Author	Emily Lockhart, Anita Tenasco, Tim Whiteduck, Susan O'Donnell
Region	Canada
Reference	Lockhart, E., Tenasco, A., Whiteduck, T., & O'Donnell, S. (2013). Information and communication technology for education in an Algonquin First Nation in Quebec. *The Journal of Community Informatics, 10*(2)
Abstract	Kitigan Zibi Anishinabeg First Nation is an innovative rural community in Quebec. Located 130 kilometers north of Ottawa, it is the closest First Nation to the Canadian capital. In both population and territory, Kitigan Zibi is the largest of the ten Algonquin communities. Broadband connectivity and information and communication technologies (ICT) are important to the community and incorporated into everyday operations. This paper explores the use of technology in the education sector in Kitigan Zibi, in particular the situation of having technology readily available at school and less so at home. This transition from a technology-filled classroom to limited or no ICT access at home is a challenge, not only for individual students and their families but also for the community as a whole.

Title:	**Towards an Indigenous Language Knowledge Base: Tools and Techniques from the Arwarbukarl Community**
Author	Daryn McKenny, Baden Hughes, Alex Arposio
Region	Australia
Reference	McKenny, D., Hughes, B., & Arposio, A., (2007) 'Towards an Indigenous Language Knowledge Base: Tools and Techniques from the Arwarbukarl Community' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people*. Hershey PA:

	Information Science Pub (p. 192 - 196)
Abstract	The Arwarbukarl Cultural Resources Association(ACRA) is a leading indigenous cultural representation and coordination body in the Hunter Valley region of New South Wales, Australia. A particular focus of ACRA is language revitalisation – made more difficult since only a smattering of documentary evidence of the language documentation evidence of the language exists from the 1830s. In 2005, the number of individuals involved in learning the Arwarbukarl language was 20. While indigenous language documentation and revitalisation efforts are by no means unique to the Arwarbukarl context, the particular indigenous community has made significant progress in the development of software tools for language analysis. Here we briefly consider a number of the important aspects (technological, functional, cultural and social) that have contributed to the success of this project.

Title:	**Digital Self-Determination: Aboriginal Peoples and the Network Society in Canada**
Author	Rob McMahon
Region	Canada
Reference	McMahon, R. (2013). Digital Self-Determination: Aboriginal Peoples and the Network Society in Canada
Abstract	Digital self-determination elaborates the links between networked digital infrastructure development and the autonomy and agency of indigenous peoples. It foregrounds how indigenous peoples are involved in the diffusion, construction, governance, and use of networked digital infrastructures. Importantly, it considers how these infrastructures are not only tools of emancipation, but can increase the surveillance and control of indigenous peoples by state and corporate interests. They can also extend the historic and ongoing reality of the 'offline' economic, social, political, and cultural marginalization of indigenous peoples. However, to accept such negative effects at face value is to fall into the trap of the teleological fallacies of social and technical determinism. Instead, in this dissertation I argue that indigenous peoples can shape and use networked digital infrastructures to support their self-determination. These processes are often guided by a recognition of self-determination that is grounded in and emergent from diverse indigenous laws, customs, and institutions. This frames digital self-determination with reference to the long-term and ongoing work of indigenous peoples to shape their own community-based media organizations and endogenous development projects. My dissertation considers these issues as they articulate with several facets of digital self-determination. I ground my argument in empirical research on the Northern Indigenous Community Satellite Network (NICSN), a cooperative socio-technical network spanning the northern regions of three Canadian provinces: Ontario, Quebec, and Manitoba. The NICSN partners collaborated to build and manage regional infrastructure in ways that reflect the needs of their constituent communities. Moving beyond considerations of access, I frame these infrastructures as socially shaped platforms of agency that are the result of dynamic negotiations and struggles between political actors seeking to advance normative agendas. These activities play out in the formation of frameworks of subsidies and regulatory conditions that reflect attempts to decolonize state-based policies and institutions. Finally, I end with a discussion of how indigenous peoples and governments are shaping online applications into spaces of convergence that reflect their goals of self-determination. Throughout this dissertation, I situate my observations in broader political, economic, and cultural contexts to elaborate both the promise and the challenge of digital self-determination.

Title:	**Making Information Technologies Work at the End of the Road**
Author	Rob McMahon, Michael Gurstein, Brian Beaton, Susan O'Donnell, Time Whiteduck
Region	Canada
Reference	McMahon, R., Gurstein, M., Beaton, B., O'Donnell, S., & Whiteduck, T. (2014). Making information technologies work at the end of the road. *Journal of Information Policy, 4*, 250-269.

Abstract	Remote and rural areas face many challenges, including the provision of telecommunications services. Regardless of universal service policies or other political promises, rural communities can be deemed unprofitable by service providers while government assistance is managed by faraway regulators who lack understanding of the affected communities and citizens. The authors assess these challenges in the context of the First Nations of Canada, via a decentralized "First Mile" framework. They find that these remote communities are capable of local innovation and can collaborate with intermediary organizations to build digital infrastructures, by bridging the gap between the public and private sectors.

Title:	**Indigenous Regulatory Advocacy in Canada's Far North: Mobilizing the First Mile Connectivity Consortium**
Author	Rob McMahon, Heather E. Hudson, Lyle Fabian
Region	Canada
Reference	McMahon, R., Hudson, H., Fabian, L. (2014) Indigenous Regulatory Advocacy in Canada's Far North: Mobilizing the First Mile Connectivity Consortium. Journal of Information Policy 4, 228-249.
Abstract	Marginalized groups such as Indigenous communities and residents of remote and rural areas face daunting challenges as they attempt to influence regulatory decision making. Can these under-resourced groups hope to have their voices heard in regulatory proceedings, in the face of well-funded corporate interests? Applying a participatory research method to regulatory hearings regarding telecommunications services in Canada's far north, the authors argue that they can, and identify specific strategies and tactics that they can employ when doing so.

Title:	**Digital Data Management as Indigenous Resurgence in Kahnawà:ke**
Author	Rob McMahon, Tim LaHache, Tim Whiteduck
Region	Canada
Reference	McMahon, R., LaHache, T., Whiteduck, T. (2015). Digital Data Management as Indigenous Resurgence in Kahnawà:ke. *The International Indigenous Policy Journal*, 6(3).
Abstract	Indigenous peoples are addressing the ongoing impacts of settler colonialism through a variety of expressions of community resurgence. Among these initiatives are those leveraging digital technologies. In the emergent network society, digital infrastructures, and information and communication technologies are powerful tools that can support self-government. In this context, we document the development of digital data management in the Mohawk community of Kahnawà:ke. Data is the digital information generated by a community, encompassing areas like research, education, finance, health, membership, housing, lands, and resources. As self-determining political entities, each First Nation determines how this data is interpreted and used, supported by tools like data management platforms and information-sharing protocols. In this article, we show how local practices regarding the collection, use, and sharing of digital data in Kahnawà:ke provides a clear example of Indigenous resurgence.

Title:	**From the First Mile to Outer Space: Tamaani Satellite Internet in Northern Quebec**
Author	Rob McMahon, Thomassie Mangiok
Region	Canada
Reference	McMahon, R., Mangiok, T. (2014) From the First Mile to Outer Space: Tamaani Satellite Internet in Northern Quebec. Journal of Community Informatics, 10 (2).
Abstract	Across Canada, discrepancies of access to broadband exist between urban centres and rural and remote Aboriginal communities. Government, public and private sector organizations are partnering to address these digital divides. Some employ a 'First Mile' approach that foregrounds how community-based institutions are driving development. This article provides a First Mile case study from the Inuit territory of Nunavik. We describe the

	cultural, social and political contexts the people of Nunavik and their government navigated to establish broadband in the region's 14 northern villages. The Kativik Regional Government is building and administering infrastructure that delivers public services and encourages economic development, balancing centralized efficiencies with the needs of residents in villages like Ivujivik.

Title:	**Digital Divides and the 'First Mile': Framing First Nations Broadband Development in Canada**
Author	Rob McMahon, Susan O'Donnell, Richard Smith, Brian Walmark, Brian Beaton
Region	Canada
Reference	Walmark, B., & Beaton, B. (2011). Digital divides and the'first mile': Framing first nations broadband development in canada. *International Indigenous Policy Journal*, 2(2)
Abstract	Across Canada, rural and remote First Nations face a significant 'digital divide'. As self-determining autonomous nations in Canada, these communities are building broadband systems to deliver public services to their members and residents. To address this challenge, First Nations are working towards a variety of innovative, locally driven broadband development initiatives. This paper contributes a theoretical discussion that frames our understanding of these initiatives by drawing on the paradigm of the 'First Mile' (Paisley & Richardson, 1998). We argue that broadband development policy in Canada must be re-framed to address the specific needs of First Nations. The First Mile position foregrounds community-based involvement, control, and ownership: a consideration we suggest has particular resonance for First Nations. This is because it holds potential to move beyond the historical context of paternalistic, colonial-derived development policies, in the context of broadband systems development. We argue First Nations broadband projects offer on-the-ground examples of a First Mile approach, and call for more research in this area.

Title:	**The Institutional Development of Indigenous Broadband Infrastructure in Canada and the United States: Two Paths to "Digital Self-Determination"**
Author	Rob McMahon
Region	Canada, US
Reference	McMahon, R. (2011). The institutional development of Indigenous broadband infrastructure in Canada and the U.S.: Two paths to 'digital self-determination'. Canadian Journal of Communication, 35(3), 115-140.
Abstract	For years, indigenous groups in Canada and the United States have argued for public policies to support the coordinated development of community-driven broadband infrastructure. Despite different national contexts and opportunities for policy implementation case studies from Canada and the United States reflect similarities in the strategic approaches of two indigenous groups to argue for increased "digital self-determination". However, the opportunities to express these arguments and the specific forms they take are shaped by the institutional contexts in each state. This article illustrates how efforts to articulate a strategy of "digital self-determination" are contingent on national contexts.

Title:	**The Use of Information and Communication Technology for the Preservation of Aboriginal Culture: The Badimaya People of Western Australia**
Author	Katina Michael, Leone Dunn
Region	Australia
Reference	Michael, K., & Dunn, L., (2007) 'The Use of Information and Communication Technology for the Preservation of Aboriginal Culture: The Badimaya People of Western Australia' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people.*

Abstract	Hershey PA: Information Science Pub (p. 170 - 174)
Abstract	Information and Communication Technology (ICT) has been applied successfully to numerous remote Indigenous communities around the world. The greatest gains have been made when requirements have been first defined by Indigenous members of the community then pattern matched to an ICT solution.

Title:	**How K-Net and Atlantic Canada's First Nation Help Desk Are Using Videoconferencing for Community Development**
Author	Mary Milliken, Susan O'Donnell, Elizabeth Gorman
Region	Canada
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).
Abstract	K-Net, Keewaytinook Okimakanak (KO) in Sioux Lookout, Ontario, Atlantic Canada's First Nation Help Desk in Membertou, Cape Breton, Nova Scotia, and the First Nation Education Council in Wendake, Quebec initially set up videoconferencing networks for educational and health purposes. Since the mid-90s, the applications, reach and scope of these communication networks has expanded to include cultural, social, and community development activities. Interviews with the technical and administrative staff reveal how the relationship-building approach taken by the organizations supports community development in the First Nations communities they serve.

Title:	**Pou Rewa: The Liquid Post, Maori Go Digital?**
Author	Maree Mills
Region	New Zealand
Reference	Mills, M. (2009). Pou Rewa: The Liquid Post, Maori Go Digital? *Third Text*, 23(3), 241-250.
Abstract	Art that uses non-traditional media and emerging technologies, specifically the electronic or digital, has the potential to create and nurture a distinctive public space for the articulation of alternative Maori world-views. Although a growing number of publications focus on contemporary Maori art practice, no specific attention has yet been given to the swelling numbers of Maori practitioners operating in the field of digital media. This essay contextualises the author's research in the wider framework of Maori digital art and seeks to explain a Maori creative practice.

Title:	**Blackfoot Lullabies and Language Revitalization**
Author	Mizuki Miyashita & Shirlee Crow Shoe
Region	USA
Reference	Miyashita, M., & Crow Shoe, S. (2009). Blackfoot lullabies and language revitalization. In Reyhnar, J. & Lockard, L. (Eds), *Indigenous language revitalization encouragement, guidance and lessons learned* (pp. 183- 190). Flagstaff, AZ: Northern Arizona University.
Abstract	This paper describes a small scale collaborative effort between a linguist and a native speaker, who is also a language educator, to collect Blackfoot lullabies to use as language teaching and learning tools. We discuss the implications of using lullabies in language revitalization and describe our fieldwork of lullaby collection, data organization and the transcription of lyrics and melody.

Title:	**Social Media in Remote First Nation Communities**
Author	Heather Molyneaux, Susan O'Donnell, Crystal Kakekaspan, Brian Walmark, Philipp Budka, Kerri Gibson
Region	Canada
Reference	Molyneaux, H., O'Donnell, S., Kakekaspan,C., Walmark, B., Budka, P., Gibson, K. (2014) Social Media in Remote First Nation Communities. *Canadian Journal of Communication* 39(2) 275-

	288.
Abstract	Community resilience in First Nations includes ties to people both inside and outside the community, intergenerational communication, sharing of stories, and family and community connectedness. This study, based on a survey of internet users in the Sioux Lookout region of Northwestern Ontario, explores the link between social networking sites (SNS) and community resilience. The region is home to some of the most isolated First Nation (indigenous) communities in Casnada. Cultural and familial links between these communities are strong, yet until the fairly recent widespread use of the internet, maintaining regular communications to strengthen cultural ties was challenging. This study examines the links between travel and communication online, how social media is used to preserve culture and maintain communication, and the implications of social networking for community resilience.

Title:	**An Example of Excellence: Chicksaw Language Revitalization through Technology**
Author	Traci L. Morris
Region	US
Reference	Morris, T. L., (2016) 'An Example of Excellence: Chicksaw Language Revitalization through Technology' in Dyson, L., Grant, S., Hendricks, M. (eds) *Indigenous People and Mobile Technologies*, Taylor & Francis, New York, NY. (p. 293 – 304)
Abstract	There are 566 federally recognized American Indian tribes in the United States, and currently little if any data exists on connectivity or uses of technology by either tribal governments or tribal citizens. There is a persistent and pervasive digital divide on tribal lands and very little data about internet use or broadband connectivity in tribal areas. Further, there are few studies on how digital technologies are used for language and cultural preservation on how digital technologies are used for language and cultural preservation or how tribal governments use these technologies to officially enhance cultural or linguistic programming. Likewise, no data exists on how Indian Country residents use social media or the internet and how tribal languages, although anecdotally we know it is happening. Technology holds great promise in stabilising tribal languages, which are in danger of extinction, allowing connections between remote peoples and between young and old.

Title:	**Toi Whakaoranga: Maori and Learning Technology**
Author	Terry Neal, Andrea Barr, Te Arani Barrett, Kathy Irwin
Region	New Zealand
Reference	Neal, T., Barr, A., Barret, T. A., & Irwin, K., (2007) 'Toi Whakaoranga: Maori and Learning Technology' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people*. Hershey PA: Information Science Pub. (p. 120 - 122)
Abstract	Maori, the indigenous peoples of New Zealand, have long felt disempowered by traditional western approaches to education. Our challenge was to build an environment that enabled genuine partnership between Maori and e-learning experts who are predominantly from a western culture. As non-Maori project leaders, we were convinced that Maori, whose improved learning was the focus of the project, should play keys roles in the decision making at all stages.

Title:	**Te Ataakura: Digital Taonga and Cultural Innovation**
Author	Wayne Ngata, Hera Ngata-Gibson, Amiria Salmond
Region	New Zealand
Reference	Ngata, W., Ngata-Gibson, H., & Salmond, A. (2012). Te Ataakura: Digital taonga and cultural innovation. *Journal of Material Culture*, *17*(3), 229-244.
Abstract	The Te Ataakura project is among the latest in a series of initiatives undertaken by the Maori tribal organization Toi Hauiti to revisit, rekindle and restore knowledge of their

ancestral taonga (artefacts), many of which are now dispersed among collections throughout New Zealand and internationally. This article describes some of these earlier projects, which deployed digital technologies in innovative ways, as part of a broader strategy of artistic and economic revitalization. It outlines Toi Hauiti's continuing efforts to build relationships with holding institutions at home and abroad, and to explore possibilities offered by recent technological developments. Setting this work in the context of similar initiatives on the part of other Ma-ori, with a focus on cultural revitalization and institutional collaboration, we consider the role of digitization in cultural endurance and dynamism, offering a critical view of emergent concepts including 'digital taonga' and 'virtual repatriation'.

Title:	**Digital Libraries and Minority Languages**
Author	David M. Nichols, Ian H. Witten, Te Taka Keegan, David Bainbridge, Michael Dewsnip
Region	New Zealand
Reference	Nichols, D. M., Witten, I. H., Keegan, T. T., Bainbridge, D., & Dewsnip, M. (2005). Digital libraries and minority languages. *New Review of Hypermedia and Multimedia*, *11*(2), 139-155.
Abstract	Digital libraries have a pivotal role to play in the preservation and maintenance of international cultures in general and minority languages in particular. This paper outlines a software tool for building digital libraries that is well adapted for creating and distributing local information collections in minority languages, and describes some contexts in which it is used. The system can make multilingual documents available in structured collections and allows them to be accessed via multilingual interfaces. It is issued under a free open-source licence, which encourages participatory design of the software, and an end-user interface allows community-based localization of the various language interfaces—of which there are many.

Title:	
Author	Victor Obonyo
Region	USA
Reference	Obonyo, V. (2009). *Smartpen Technology and Revitalization of The Myaamia Language.* (Electronic Thesis or Dissertation). Retrieved from https://etd.ohiolink.edu/
Abstract	The main purpose of this research is to determine whether appropriate technology can contribute towards revitalization of the Myaamia language. Language revitalization refers to the development of programs and other learning opportunities that result in re-establishing a language, which has ceased being the language of communication, and bringing it back into use in everyday life. Although it seems possible that various technologies can play an important role in these efforts, a survey of language revitalization programs has shown little assessment of the role of technology in language revitalization. In this project, a case study was done to determine, to what extent, if any, appropriately designed technology (in this case a Smartpen) can be useful in Myaamia language revitalization efforts. The result collected, after participants had used the research material, showed that technology, if configured appropriately and made interesting and purposeful, can play an important role in language revitalization efforts.

Title:	**Videoconferencing for First Nations Community-Controlled Education Health and Development**
Author	Susan O'Donnell, Lyle Johnson, Tina Kakepetum-Schultz, Kevin Burton, Tim Whiteduck, Raymond Mason, Brian Beaton, Rob McMahon, Kerri Gibson
Region	Canada
Reference	O'Donnell, S., Johnson, L., Katepetum-Schultz, T., Burton, K., Whiteduck, T., Mason, R., Beaton, B., McMahon, R., Gibson, K. (2013) Videoconferencing for First Nations community-controlled education, health and development. *The Electronic Journal of Communication*. 23

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Abstract	Videoconferencing is a powerful tool that First Nations in Canada are using to create communication spaces for local control of community services and community development. For First Nations in Canada, videoconferencing sessions are alternative public spheres for engagement and interaction outside of mainstream control. This article discusses how First Nations are using videoconferencing to create and support community-controlled education and training, health services, and other community development activities. Perspectives of a videoconferencing bridge coordinator and a case study from Keewaywin First Nation are discussed. Challenges for videoconferencing in First Nations are reviewed, followed by some thoughts about the future of videoconferencing in these unique communities.

Title:	**Videoconferencing and Sustainable Development for Remote and Rural First Nations in Canada**
Author	Susan O'Donnell, Brian Beaton, Fenwick McKelvey
Region	Canada
Reference	O'Donnell, S., Beaton, B., & McKelvey, F. (2008). Videoconferencing and sustainable development for remote and rural First Nations in Canada. Proceedings of the community informatics research network (CIRN 08) Conference, Prato, Italy, October.
Abstract	Videoconferencing can be used to connect remote and rural First Nation communities to work together on sustainable development priorities. This paper presents two case studies of videoconferencing events. In both cases, a real-time high-bandwidth connection provided rich visual and audio data to be exchanged among communities separated by vast distances. The host communities for these videoconference events are small First Nations with traditional lifestyles connected to the land. Despite their remoteness and traditional cultures, these communities have the capacity to use advanced high-bandwidth technologies in innovative ways to contribute to sustainable development of their communities.

Title:	**A New Remote Community-owned Wireless Communication Service: Fort Severn First Nation Builds their Local Cellular System with Keewaytinook Mobile**
Author	Susan O'Donnell, George Kakekaspan, Brian Beaton, Brian Walmark, Raymond Mason, Michael Mak
Region	Canada
Reference	O'Donnell, S., Kakekaspan, G., Beaton, B., Walmark, B., Mason, R., & Mak, M. (2012). A new remote community-owned wireless communication service: Fort severn first nation builds their local cellular system with keewaytinook mobile. *Canadian Journal of Communication, 36*(4), 663.
Abstract	Fort Severn First Nation is a remote fly-in community on Hudson Bay. Its lifestyle reflects a deep respect for and connection to the land. The Keewaytinook Okimakanak (KO) Tribal Council has developed the Keewaytinook Mobile (KM) service in remote First Nation communities in Northern Ontario. In November 2009, Fort Severn and KO established the KM service in the community. This study traces the history of KM and its implementation in Fort Severn and descrives how and why community members are using the service.

Title:	**Information Technologies (ICT) and Remote and Rural First Nations Communities: An Overview**
Author	Susan O'Donnell, Mary Milliken, Corinna Chong, Brian Walmark
Region	Canada
Reference	O'Donnell, S., Milliken, M., Chong, C., & Walmark, B. (2010). Information and communication technologies (ICT) and remote and rural first nations communities: An overview. Paper presented at the 2010 Canadian Communication Association Annual Conference (CCA 2010), pp. 1-15.

Abstract	Information and communication technologies (ICT) are valuable tools used to establish and maintain connections within and between remote and rural First Nations communities across Canada, and between urban centres and these communities. For the past decade, various research projects have investigated different aspects of ICT use by and with these communities. However, an overview of this research has not been published. This paper, a literature review, explains the history of ICT and First Nations communities, policies and partnerships for broadband services in First Nations, how remote and rural First Nations are accessing and using ICT, and how to make the broadband networks and ICT sustainable.

Title:	**How the Washaho Cree Nation at Fort Severn Is Using a 'First Mile Approach' To Deliver Community Services**
Author	Susan O'Donnell, Brian Walmark, Brian Beaton, Kerri Gibson, Matthew Kakekaspan
Region	Canada
Reference	O'Donnell, S., Kakekaspan, G., Beaton, B., Walmark, B., Mason, R., Mak, M. (2012) A New Remote Community-Owned Wireless Communication Service: Fort Severn First Nation Builds Their Local Cellular System with Keewaytinook Mobile. *Canadian Journal of Communication*, 36 (4) 663-673.
Abstract	Fort Severn First Nation is a remote fly-in community on Hudson Bay. The lifestyle reflects a deep respect for and connection to the land. The Keewaytinook Okimakinak (KO) Tribal Council has developed the Keewaytinook Mobile (KM) service in remote First Nation communities in Northern Ontario. In November 2009, Fort Severn and KO established the KM service in the community. This study traces the history of KM and its implementation in Fort Severn and describes how and why community members are using the service. The analysis is based on interviews and discussions with community members during three research visits from March 2010 to March 2011.

Title:	**Broadband Video Communication Research in First Nation Communities**
Author	Sonja Perley, Susan O'Donnell
Region	Canada
Reference	Perley, S., & O'Donnell, S. (2006). Broadband video communication research in first nation communities. http://meeting.knet.ca/mp19/file.php/16/Publications/2006-Perley-ODonnell-CCA.pdf
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.

Title:	**First Mile Challenges to Last Mile Rhetoric: Exploring the Discourse Between Remote and Rural First Nations and the Telecom Industry**

Author	Duncan Philpot, Brian Beaton, Tim Whiteduck
Region	Canada
Reference	Philpot, D., Beaton, B., & Whiteduck, T. (2013). First mile challenges to last mile rhetoric: Exploring the discourse between remote and rural first nations and the telecom industry. *The Journal of Community Informatics*, 10(2)
Abstract	Solving Canada's digital divide remains a significant issue, particularly considering how broadband networks have an impact on remote and rural areas politically, economically, socially, and culturally. Attached to this, as well, are the politics of the historical relationship between remote and rural First Nation communities, corporations, and the government. The way in which the relationship between remote and rural First Nations, the federal and provincial governments, and the telecommunications industries is reproduced is largely through discursive means. One of the consequences of this is that many outsiders to this issue are largely misinformed through documents and press releases. These documents frame remote and rural First Nations as helpless and dependent upon government and telecom industry intervention in order to secure their dependence upon their services. We argue that this is another form of political colonialism; a form of colonialism which seeks to create dependence upon the service economy for its own survival. In this paper, we examine the discourse surrounding the issue of remote and rural broadband connectivity as a means of exploring the reproduction of established narratives of First Nations dependence upon aid and service. We also explore how First Nations communities are using websites and documents of their own to counter these portrayals of their 'plight' by emphasising their desire to own and operate ICT services in their communities with local members, for local members. We conclude that there is a significant challenge that remote and rural First Nations face, but that the steps that have been taken are towards escaping the cycle of co-dependency.

Title:	'The Potential Diversity of Things We Call TV': Indigenous Community Television, Self-Determination and NITV
Author	Ellie Rennie, Daniel Featherstone
Region	Australia
Reference	Rennie, E., & Featherstone, D. (2008). 'The Potential Diversity of Things We Call TV': Indigenous Community Television, Self-Determination and Nitv. *Media International Australia*, 129(1), 52-66. Chicago
Abstract	The National Indigenous Television (NITV) service was launched in July 2007. NITV's public service broadcasting model has arrived after two decades of successful community-based enterprise. Indigenous groups, guided by policies of self-determination, developed a robust grassroots media system based on community ownership and regional collaboration. The arrival of NITV raised important questions for the sector. Can locally sourced content provide the levels of leadership and national unity achieved by public service media during the broadcast era? How can Indigenous media play a greater role in the Australian public sphere? Can locally controlled media offer national narratives? Where does industry development begin and end? As the Indigenous media sector faces up to these issues, two distinct approaches are emerging. One presents a unified picture of Indigenous Australia; the other enables diverse groups to tell their own stories. This paper examines the tensions and possibilities of the new Indigenous media landscape by looking back at the self-determination governance model of the past.

Title:	Student Technology Projects in a Remote First Nations Village
Author	Tish Scott
Region	Canada
Reference	Scott, T., (2007) 'Student Technology Projects in a Remote First Nations Village' in Dyson, L., Hendriks, M and Grant, S. (eds). *Information technology and indigenous people.* Hershey PA: Information Science Pub. (p. 137 - 140)

Abstract	This qualitative case study focuses on community members' observations and perceptions of student multimedia technology projects produced in a grade 6/7 class, particularly in relation to what they affirm is important for their children's education. The projects are community-based and rooted in the First Nations culture of a remote village in northern British Columbia (Canada).

Title:	**Post-Secondary Distance Education in Contemporary Colonial Context: Experiences of Students in Rural First Nation in Canada**
Author	Jesse Simon, Kevin Burton, Emily Lockhart, Susan O'Donnell
Region	Canada
Reference	Simon, J., Burton, K., Lockhart, E., & O'Donnell, S. (2014). Post-secondary distance education in a contemporary colonial context: Experiences of students in a rural First Nation in Canada. *The International Review of Research in Open and Distributed Learning*, 15(1)
Abstract	Post-secondary distance education gives students and their families living in remote and rural regions the option to stay in their communities while they study instead of moving closer to the universities in cities. Post-secondary distance education is an option in many rural and remote First Nation (Indigenous) communities in Canada; however there are many challenges to successful adoption in these communities. There are also many opportunities for post-secondary institutions to expand their abilities and capacity in developing and delivering appropriate content supporting these unique, self-governing environments in Canada. We explore the experiences of students from a rural First Nation in Canada with post-secondary distance education, focusing on how different delivery methods offer both opportunities and challenges for community-based students. The study is situated in the context of contemporary colonialism in Canada.

Title:	**The Use of Podcasts to Improve the Pronunciation of the Maori Language and Develop Reflective Learning Skills**
Author	Lisa J. Switalla-Byers
Region	New Zealand
Reference	Switalla-Byers, L. J., (2016) 'The use of podcasts to improve the pronunciation of the Maori language and develop reflective learning skills' in Dyson, L., Grant, S., Hendricks, M. (eds) *Indigenous People and Mobile Technologies*, *Technologies*, Taylor & Francis, New York, NY. (p. 179-194)
Abstract	This chapter makes recommendations on how teachers can enhance student's reflective skills and learning strategies within the classroom, encouraging them to self-monitor, be persistent and take personal responsibility for their learning. A glossary of Maori terms is included at the end of the chapter to assist readers.

Title:	**The Influence of Mobile Phones on the Languages and Cultures of Papua, New Guinea**
Author	Olga Temple
Region	New Guinea
Reference	Temple, O., (2016) 'The influence of mobile phones on the languages and cultures of Papua New Guinea' in Dyson, L., Grant, S., Hendricks, M. (eds) *Indigenous People and Mobile Technologies*, Taylor Francis, New York, NY. (p. 274 –292)
Abstract	Because "Memory is enhanced to the extent that systems of writing and of symbols, together with the methods for using those symbols, are enhanced (Vygotsky 1930), the Internet and the new mobile communication technologies have marked another pivotal point in the development of our civilizations by enabling instant series of exchanges globally and in real time. Digital technologies have connected our world, erasing geographical and political barriers that had separated societies and culture. By giving individual and organizations access to all human knowledge ever accumulated, they have expanded our collective RAM exponentially.

Title:	**Indigenous Dot Com: E-learning in Australian Indigenous Workforce Development and Engagement**
Author	Ruth Wallace, Rhonda Appo
Region	Australia
Reference	Wallace, R., & Appo, R. (2011). Indigenous dot com: E-learning in Australian indigenous workforce development and engagement. *Vocational learning* (pp. 95-110) Springer.
Abstract	Improving the engagement and outcomes of Australian Indigenous people through training is underpinned by understanding the nature and experiences of learning for different people in a range of contexts. A number of Indigenous engagement projects that incorporated e-learning strategies were conducted between 2005 and 2007. These projects utilized a range of e-tools and strategies to embed e-learning into learning programmes that will improve the outcomes for Indigenous1 people, Australia-wide. This analysis explores the impact of e-learning-based pedagogy on the educational and employment outcomes of Indigenous people. In particular, the impact of incorporating e-learning into vocational education and training on Indigenous learners' engagement, training and employment are considered. This chapter examines six case studies and reflects on the issues identified through this analysis. The theme identified centres around structures and processes. Structures include the use of technology in education and developing culturally appropriate training resources. The processes include professional development, integration of e-learning, partnerships and diverse representations of knowledge. The implication for investment in these processes and structures that enhances and supports learning and employment outcomes for Indigenous people is discussed. E-learning projects are aimed at addressing the skills and qualification gaps needed to gain successful employment outcomes. These projects had a particular focus on the involvement of Indigenous champions in the project and sustainability which are also discussed.

Title:	**LEOKI: A Powerful Voice of Hawaiian Language Revitalization**
Author	Mark Warschauer, Keola Donaghy & Hale Kuamoÿo
Region	USA
Reference	Warschauer, M., Donaghy, K., & Hale Kuamoÿo, H. (1997) Leoki: A powerful voice of Hawaiian language revitalization. Computer Assisted Language Learning, 10:4, 349-361, DOI: 10.1080/0958822970100405. Retrieved from http://www.tandfonline.com.proxy.hil.unb.ca/doi/pdf/10.1080/0958822970100405
Abstract	Political and linguistic repression over a period of one hundred years nearly brought the death of the Hawaiian language. In the last thirty years though, a Hawaiian renaissance movement has helped revitalize the Hawaiian language. Hawaiian language activists and scholars are taking advantage of every possible tool to promote their language, including computers and the Internet. This article discusses the role of computing and online communications in Hawaiian language revitalization, focusing on the Leoki bulletin board system, the first BBS in the world fully based on an indigenous language.

Title:	**Developing an e-Community Approach to Community Services in Kitigan Zibi Anishinabeg First Nation**
Author	Gilbert Whiteduck, Anita Tenasco, Susan O'Donnell, Tim Whiteduck, Emily Lockhart
Region	Canada
Reference	Whiteduck, G., Tenasco, A., O'Donnell, S., Whiteduck, T., & Lockhart, E. (2013). Developing an e-community approach to community services in kitigan zibi anishinabeg first nation. *The Journal of Community Informatics,* 10(2)
Abstract	Kitigan Zibi Anishinabeg First Nation is a leader in community and social services. This rural First Nation – the largest Algonquin community in Canada - has since 1980 successfully supported community members to take ownership of service development and delivery. They have made many services and programs available to community members, including:

	an elementary and secondary school, a day-care, a community hall, a community radio, a health centre, a police department, a youth centre, and others. Their community services are led and staffed by fully trained and qualified community members. As computers, broadband internet and cellular services have become available in Kitigan Zibi, the service sectors have been integrating these technologies with a goal of improving services for and communications with community members. However they face many challenges in their efforts to remain innovative and plan for future delivery of services using technologies. Our study, based on qualitative analysis from interviews with 14 community services staff in Kitigan Zibi, will explore their current successes, challenges, and future potential for integrating information and communication technologies (ICT) into services that promote community and social development. The analysis discusses the eCommunity approach advocated by the Assembly of First Nations

Title:	**Resilience as a Quadripartite Responsibility: Indigenous Students and Distance Education**
Author	Julie Anne Willems
Region	Australia
Reference	Willems, J. A. (2012). Resilience as a quadripartite responsibility: Indigenous students and distance education. *Journal of Open, Flexible and Distance Learning*, 16(1), 14-27.
Abstract	Considerations of educational resilience are often linked to student participation, retention, and outcomes in distance higher education, in spite of adversity, equity issues, or 'invisible fences' that students may face. This paper further develops the quadripartite model of educational resilience (Willems, 2010; Willems & Reupert, forthcoming); that is, educational resilience as the shared responsibility of students, educators, institutions, and communities—as a means to help assess and promote educational resilience and minimise student attrition in a specific cohort of distance learners, namely indigenous peoples. Through this lens the experiences of an online indigenous distance learner are explored.

Title:	**Opportunities and Challenges for First-Mile Development in Rural Hawaiian Communities**
Author	Jenifer Sunrise Winter, Wayne Buente, Patricia Amaral Buskirk
Region	Hawaii, USA
Reference	Winter, J. S., Buente, W., & Buskirk, P. A. (2013). Opportunities and challenges for first-mile development in rural hawaiian communities. *The Journal of Community Informatics*, 10(2)
Abstract	The islands of Hawai'i are the most geographically remote locations on earth and connect to the global Internet via expensive submarine fiber. While citizens in densely populated areas such as Honolulu have several options for broadband coverage, there are gaps throughout the state. Many of those living in rural areas, including indigenous Hawaiian communities, suffer from a lack of critical infrastructures. For indigenous Hawaiians trying to gain equal access to educational and economic opportunities, health care, and linguistic and cultural preservation, this disparity is particularly troubling. We describe challenges faced by Native Hawaiian communities in developing affordable, high-quality broadband access and describe initiatives, to date, that seek to address them. We suspect that the conventional planning approach to broadband development is incongruent to the unique economic, social and cultural contexts present in Hawaiian rural communities. Our investigation explores the potential for community-initiated broadband projects that will enable indigenous Hawaiians more self-determination in the planning and management of broadband networks and services.

Appendix II: Online Indigenous Language Resources

This resource is divided into:
1. Apps
2. Language Portals
3. Online Games by Indigenous People
4. Visual Arts
5. Social Media
6. Examples of Indigenous Organizations and Businesses Online
7. Other Sites with Indigenous Language and Culture Information

1. Apps

Title	Cree FHQTC
Region	Canada
Language Group	Cree
Reference	https://itunes.apple.com/ca/app/cree-fhqtc/id839720921?mt=8
Brief Description	File Hills Qu'Appelle Tribal Council of Fort Qu'Appelle Saskatchewan, Canada is delighted to present to you a Cree Language app now available on iTunes App store. This app offers learning, practice, games and quizzes in many everyday categories such as greetings, phrases, vowels, expressions and much more! Learn your language so that it will be kept alive for generations to come.

Title	First Voices Mobile Apps
Region	Canada
Language Group	National
Reference	http://www.fpcc.ca/language/FirstVoices/FirstVoices-Mobile.aspx
Brief Description	First Peoples' Cultural Council is a leader in the development and deployment of technology-based solutions for Indigenous language reclamation and revitalization. The wealth of language data uploaded by Indigenous community champions to FirstVoices.com is being repurposed in multiple dictionary and tutor apps like the ones listed below.

Title	L'nui'suti
Region	Atlantic
Language Group	Mi'kmaq
Reference	https://itunes.apple.com/ca/app/lnuisuti/id918629700?mt=8&ign-mpt=uo%3D4
Brief Description	L'nui'suti app is intended for non-speakers to learn the Mi'kmaw language. All content in this app is used in first person singular.

Title	Tal-Tluen?
Region	Atlantic
Language Group	Mi'kmaq
Reference	https://itunes.apple.com/ca/app/tal-tluen/id1081105385?mt=8&ign-mpt=uo%3D4
Brief Description	Choose phrase components to build simple common Mi'kmaw phrases, and hear them spoken. Copy to clipboard feature allows you to use to paste the phrase into Messages or Email.

2. Language Portals

Title	Aboriginal Language
Region	Atlantic
Language Group	Mi'kmaq
Reference	http://firstnationhelp.com/ali/lessons.php
Brief Description	Website dedicated to all the Elders and ancestors who dared to dream the dream of keeping our culture and language strong while taking control of our education, to all of those who work to make that dream come true, and to the children who will have to work even harder to make it come true for their children.

Title	The Algonquian Linguistic Atlas
Region	Canada
Language Group	Algonquian languages
Reference	www.atlas-ling.ca http://resources.atlas-ling.ca
Brief Description	The goal of the project is to co-create an on-line, multimedia linguistic atlas of Algonquian languages. The creation of this atlas allows us to offer many training opportunities for sound editing and linguistic description training to aboriginal students. One of our goals is also to create contacts between curriculum developers, language specialists and lexicographers of Algonquian languages, with a focus on on-line language resources and dictionaries. We investigate user-friendly and culturally appropriate computing interfaces and database structures. We encourage dialogue, share our Open Source programs, and provide linguistic and computer training and technical support. This project is a fertile ground for knowledge transfer and mutual inspiration, with all parties working in a collaborative spirit. Our ultimate goal is to make sure that the beautiful Algonquian languages and the cultures they embody will be heard and spoken by many more generations to come. The resources lists the different digital Indigenous language portals available and being developed with their partners.

Title	Eastern James Bay Cree Dictionary
Region	Quebec – Eastern James Bay
Language Group	Cree
Reference	http://dictionary.eastcree.org/
Brief Description	This site is about the East Cree language, spoken in Northern Quebec, Canada, in the James Bay area. The East Cree language is a Native American language of North America and belongs to the Algonquian language family. This site is intended as a resource for Cree language teachers, literacy instructors, translators, linguists, and anyone who has an interest in the nuts and bolts of the East Cree language. We hope that the live possibilities of the internet will encourage participation. We are seeking support form all who value linguistic diversity and want the Cree language to be alive and well in the 21st century and after. Started in 2000, the site has been growing ever since. There are two major dialects of East Cree: Southern and the Northern dialects, with their own standardized orthography. Some, but not all pages are available in both dialects, depending on whether its author is a Southern or a Northern speaker. There is room in the databases to also include Inland and Coastal variations. Know that our intend is to find a balance between standardization and respect of speech diversity.

Title	FirstVoices
Region	Canada
Language Group	Various
Reference	http://www.firstvoices.com/en/home (Main page) http://www.firstvoiceskids.com/cgi-bin/WebObjects/FVKids.woa/wa/default http://www.firstvoiceskids.com/cgi-bin/WebObjects/FVKids.woa/wa/default (Kids page)
Brief Description	FirstVoices is a suite of web-based tools and services designed to support Aboriginal people engaged in language archiving, language teaching & culture revitalization. The FirstVoices Language Archive contains thousands of text entries in many diverse Aboriginal writing systems, enhanced with sounds, pictures and videos. A companion set of interactive online games is designed to present the archived FirstVoices language data in creative learning activities. Some language archives at FirstVoices are publicly accessible, while others are password protected at the request of the language community.

Title	Fort Severn Cree Dictionary
Region	Northern Ontario
Language Group	Cree
Reference	http://fortsevern.atlas-ling.ca/
Brief Description	This is web version of a bilingual Ininîwimowin-English and English- Ininîwimowin dictionary, designed specifically for use in the northern Ontario Cree community of Fort Severn (Wasaho).

Title	Cayuga Language Website
Region	Ontario
Language Group	Mohawk
Reference	http://cayugalanguage.ca/
Brief Description	The site is developed and maintained by the SSHRC-funded CURA project "Cayuga: Our Oral Legacy" (COOL), a joint endeavour between the Linguistics Department at Memorial University in Newfoundland and Labrador and the Woodland Cultural Centre at Six Nations Reserve in Ontario. The website was created to share and promote Cayuga language resources and the work being done by the COOL Project.

Title	Innu-Aimun
Region	Labrador
Language Group	Innu
Reference	http://www.innu-aimun.ca/
Brief Description	*Innu-aimun.ca* aims to celebrate the Innu language and culture and to share a wide range of Innu language resources, in particular those created under the auspices of the *Innu Language Project.* This website is the result of a joint partnership between the Linguistics Department at Memorial University, the School of Linguistics and Language Studies at Carleton University, the Labrador Innu School Board (*Mamu Tshishkutamashutau – Innu Education*) and the Quebec Innu organization *Institut Tshakapesh*.

Title	Inuktitut
Region	Nunavut
Language Group	Inuit
Reference	http://www.tusaalanga.ca/splash

Brief Description	Pirurvik's Inuktitut as a Second Language programs offer an innovative approach to mastering the Inuit language. We focus on teaching Inuktitut as it is spoken in everyday situations. After the first class, participants are able to walk away and immediately apply what they have learned. The Tusaalanga website contains many of the materials used in our training programs. The sound files it includes are a valuable tool to help learners master correct pronunciation.

Title	The Jilaptoq – A digital integrative Mi'kmaq Online Talking Dictionary
Region	Mi'kmaq Territory
Language Group	Mi'kmaq
Reference	http://www.jilaptoq.ca/en/index.html
Brief Description	The talking dictionary project is developing a 6000+ word internet resource for the Mi'gmaq/Mi'kmaq language. Multiple speakers allow one to hear differences and variations in how a word is pronounced. The Jilaptoq Mi'kmaw Language Center involves the creation of digital, multimedia, and interactive Mi'kmaw educational support material (stories/songs/prayers/talking posters/videos/vocabulary)

Title	Mi'kmaq Online
Region	Atlantic
Language Group	Mi'kmaq
Reference	http://www.mikmaqonline.org/
Brief Description	The talking dictionary project is developing an Internet resource for the Mi'gmaq/Mi'kmaq language. Each headword is recorded by a minimum of three speakers. Multiple speakers allow one to hear differences and variations in how a word is pronounced. Each recorded word is used in an accompanying phrase. This permits learners the opportunity to develop the difficult skill of distinguishing individual words when they are spoken in a phrase. Thus far we have posted over 3900 headwords, a majority of these entries include two to three additional forms. The project was initiated in Listuguj, therefore all entries have Listuguj speakers and Listuguj spellings. In collaboration with Unama'ki, the site now includes a number of recordings from Unama'ki speakers. More will be added as they are recorded. Eventually this site will include the Smith-Francis spellings used there.

Title	Native Languages of the Americas: Passamaquoddy-Maliseet Language
Region	Atlantic
Language Group	Passamaquoddy Maliseet
Reference	http://www.native-languages.org/mali.htm#language
Brief Description	This Algonquian language has two major dialects: Maliseet (or Malécite), spoken mainly in New Brunswick, and Passamaquoddy (or Peskotomuhkati), spoken mostly in Maine. There are 1500 speakers of both dialects combined. Very few people in the younger generations speak the Passamaquoddy-Maliseet language (especially the Passamaquoddy dialect), but language revival efforts are underway to restore its use among Maliseet and Passamaquoddy children. This website provides various Passamaquoddy-Maliseet language resources.

Title	The Nishnaabemwin Web Dictionary
Region	Northeastern Ontario
Language Group	Algonquian
Reference	http://nishnaabemwin.atlas-ling.ca/#/help
Brief Description	The Nishnaabemwin Web Dictionary contains over 12,000 words. It represents the Odawa dialects spoken along the shores of Lake Huron, with a particular emphasis on the varieties spoken on Manitoulin Island, where fluency is by far the greatest. It also

	documents Eastern Ojibwe. It is the first to dictionary of any Ojibwe dialect to contain copious examples, drawn from both published and unpublished text materials, as well as thousands of examples created by co-editor Dr. Mary Ann Naokwegijig-Corbiere, a prominent Nishnaabemwin educator and fluent speaker of Manitoulin Odawa. It represents the result of 20 years of careful and intensive documentary research conducted by the editors with Elders and speakers of the language, including on-site elicitation and checking sessions in almost all communities where the language is still spoken, carefully carried out by Dr. Naokwegijig-Corbiere, and conducted in both Nishnaabemwin and English. It also provides nuanced, sense-based, glossing of Nishnaabemwin vocabulary, due to Dr. Naokwegijig-Corbiere's full fluency in both English and Odawa, and her careful attention to semantic detail. This 2015 online edition allows searches in English and Nishnaabemwin, and will produce results based on searches of both Nishnaabemwin words and example sentences, as well as English keywords and glosses.

Title	**The Passamaquoddy-Maliseet Language Portal**
Region	Atlantic
Language Group	Passamaquoddy - Maliseet
Reference	http://pmportal.org/
Brief Description	The Passamaquoddy-Maliseet Language Portal links the 18,000-word online Passamaquoddy-Maliseet Dictionary with an extensive archive of videos of conversations and activities of Passamaquoddy-Maliseet speakers. The Portal is designed as a resource for language learning and research. It can be entered in either of two ways: While viewing Dictionary Items, you can link to videos in which the same word is used. Then viewing Videos, you can link to the dictionary entries of words that appear in the subtitles; in those entries, you may find links to additional related videos. The Portal now integrates dictionary development with media archives of Passamaquoddy language and culture, including public access and feedback functions, to create a resource that encourages language use, language learning, research, and continuing documentation

Title	**Spoken Cree**
Region	Canada
Language Group	Cree
Reference	www.spokencree.org
Brief Description	This website was created to aid in the dissemination of the Cree language-learning audio material developed by C. Douglas Ellis as well as archival recordings of the Cree dialects spoken in Western James Bay. The Spoken Cree language-learning materials are designed to provide a thorough grounding in the spoken language within the context of Cree society. Conversations, drill exercises and listening-in sections have all been recorded by native speakers to supply the most authentic models of speech for the student. The Dictionary contains the glossary of the three volumes of Spoken Cree, organized in a searchable database.

3. Online Games by Indigenous People

Title	**Dakota & Nakota Animated Phrase Book**
Region	Prairies
Language Group	Dakota
Reference	http://www.sicc.sk.ca/dakota-and-nakota-animation-resource.html
Brief Description	The Dakota & Nakota Animated Phrase Book is an online educational resource for educators that address basic conversational phrases in the Saskatchewan First

Nations language of Dakota and Nakota and in the respective male and female voices. The animated phrase books are appropriate for aspects of everyday life including school and office settings. This online resources are particularly useful for First Nations language immersion school and language activities to support learning by the students and non-fluent teachers, administrators and staff.

Title	**Honour Water**
Region	Central Canada
Language Group	Anishinaabe
Reference	http://www.honourwater.com/#intro
Brief Description	*Honour Water* is a singing game for healing water that passes on songs in Anishinaabemowin, the Anishinaabe language. Songs are gifted by Sharon Day, the Oshkii Giizhik Singers, and Elders who collaborated at the Oshkii Giizhik Gathering. Water teachings are interwoven with singing challenges alongside art by Elizabeth LaPensée. People from all over are welcome to sing these songs with good intentions for the water. The hope is to pass on these songs through fun gameplay that encourages comfort with singing and learning Anishinaabemowin, the language of Anishinaabeg. The game includes three songs--Miigwech Nibi, Gii Bimoseyaan, and Gizaagi'igonan Gimaamaanan Aki. They represent low, medium, and high level singing challenges which are determined by the complexity of Anishinaabemowin in the lyrics. The lyrics are sung in Anishinaabemowin, written in Anishinaabemowin in Roman Orthography, and also written in English translations. Successfully completing a song unlocks vital water teachings.

Title	**Never Alone (Kisima Ingitchuna)**
Region	Alaska
Language Group	Iñupiat
Reference	http://neveralonegame.com/game/
Brief Description	Never Alone (Kisima Ingitchuna) is the first game developed in collaboration with the Iñupiat, an Alaska Native people. Nearly 40 Alaska Native Elders, storytellers and community members contributed to the development of the game. Play as a young Iñupiat girl and an arctic fox as they set out to find the source of the eternal blizzard which threatens the survival of everything they have ever known. Never Alone leverages the power of videogames to share, celebrate and extend culture. These World Games will empower indigenous communities around the world to share their stories in an authentic, engaging, and entertaining way.

Title	**Ienien:te and the Peacemaker's Wampum**
Region	Canada
Language Group	Mohawk
Reference	http://skins.abtec.org/skins4_.html
Brief Description	Participants of the Skins 4.0 workshop that took place at Concordia University from May 27th until June 14th, 2013 created this game. Ienién:te and the Peacemaker's Wampum follows our heroine, Ienién:te (yeh-YAWN-day), home from University with her brand new Archeology degree, as she is visited in a dream by a bear spirit. The spirit tells her of evil wrongdoings nearby--which only she can set right. Using a combination of the school smarts she brings home from University and the traditional knowledge that she learns from her grandmother in the game, Ienién:te avoids security guards' flashlights and solves increasingly difficult puzzles to reach an ancient sacred and powerful artifact--the Peacemaker's original wampum. The wampum was stolen by her evil archaeology professor, who is using their power to

	fuel his own immortality. Only by rediscovering her culture and returning the artifacts can she foil the corporate aspirations of world domination and protect the worlds from the powerful ancient evils they had carelessly unleashed

Title	**Survivance**
Region	Central Canada
Language Group	Anishinaabe
Reference	http://survivance.org/survivance-the-game/
Brief Description	*Survivance* is a social impact game that asks us to explore our presence and create works of art as a pathway to healing. Players choose from non-linear quests that are structured in the phases of the Indigenous life journey. At the end of each quest, players create an act of survivance—a form of self-determination based on Anishinaabe scholar Gerald Vizenor's term "survivance." Survivance merges survival and endurance in asserting Indigenous presence in contemporary media.

Title	**Virtual Songlines**
Region	Australia
Language Group	
Reference	http://virtualsonglines.com.au/
Brief Description	Virtual Songlines is a real-time, first and third-person authentic cultural heritage adventure. Inspired by virtual reality, we apply game theory to interactive technology to resurrect feelings of empathy and bring greater understanding of the cultural heritage of Australia's first peoples. We design unique and immersive landscapes that players can explore. By understanding their environment, players can craft the appropriate tools or weapons necessary for hunting and gathering and thus ensure their survival. Virtual Songlines presents stunning original 3D landscapes, cultural song, engaging historical 3D characters, dramatic soundscapes and challenges the player to master their environment through adherence to the customs and wisdom of our Elders.

Title	**Path of the Elders**
Region	Canada
Language Group	Cree
Reference	http://pathoftheElders.com/game
Brief Description	This is the story of the Mushkegowuk and Anishinaabe Peoples of North-Eastern and North-Western Ontario, Canada and the signing of Treaty No. Nine (James Bay Treaty) in the indigenous territory known as Nishnawbe Aski Nation (People's Land). Our goal is to provide you with an understanding of the historical times in which Mushkegowuk and Anishinaabe peoples signed Treaty No. Nine, and how this treaty has impacted the lives of our people. We are very committed to documenting Elder knowledge that is slipping away in so many communities across Canada. Elder and traditional knowledge is a key resource that has been used to create the content for 'On the Path of the Elders'. Take your time now and explore the site. Jump right in and play the game, watch a video, view some photos or listen to a story. Read the essay. It contains a great deal of important, cultural information that will give you a firm understanding of the Mushkegowuk and Anishinaabe Peoples. Our hope is that this site enriches your life and you come to appreciate, more deeply, the history and culture of our people.

4. Visual Arts

Title	Blue Earth Photos
Region	Canada
Language Group	
Reference	https://blueearthphotos.wordpress.com/page/3/
Brief Description	We're visual storytellers. Our goal is to help strengthen and empower communities, organizations and individuals to realize their visual ideas - ideas that help build cultural identity, reinforce unique qualities, and highlight their innate abilities. We provide portrait work for individuals, corporate needs, and non-profit campaigns. We also photograph weddings and events. All with one goal in mind - to share stories. We're based in Sioux Lookout, but work throughout Northwestern Ontario and beyond.

Title	Red Works Photography
Region	Canada
Language Group	
Reference	http://www.redworks.ca/ http://www.redworks.ca/portfolio-category/concrete-indians/# https://www.facebook.com/Red-Works-Photography-152439735699/home
Brief Description	Red Works is a dynamic photography company empowering contemporary Indigenous lifestyles/ cultures & specializing in portrait, event +concert photography. Mission: "We, as Indigenous people, are often portrayed in history books as Nations once great; in museums as Nations frozen stoic; in the media as Nations forever troubled. These images can be despairing; however, my goal seeks to steer the positive course. If our history is a shadow, let this moment serve as light. We are musicians, lawyers, doctors, mothers and sons. We are activists, scholars, dreamers, fathers and daughters. Let us claim ourselves now and see that we are, and will always be great, thriving, balanced civilizations capable of carrying ourselves into that bright new day." — Nadya Kwandibens

Title	Tea & Bannock
Region	Canada
Language Group	
Reference	https://teaandbannock.com/
Brief Description	Tea and Bannock is a collective blog that features the work of seven photographers from across the country. Indigenous women, holding each other up. Visual artists, supporting each other. A safe place to talk about the work, interpretation and inspiration behind projects. A place that reminds us of sitting at home around the kitchen table, with *tea&bannock.*

5. Social Media

Title	Pemaptog
Region	Atlantic
Language Group	Mi'kmaq
Reference	https://twitter.com/pemaptoq
Brief Description	'Pjilita'gw, pjilita'kw, ptjilitago, welcome. Daily word tweet in 3 writing systems from

	Mi'gmaq-Mi'kmaq Online Ugsituna'tas'g Glusuaqanei Talking Dictionary

Title	**Savvy Unltd**
Region	Atlantic
Language Group	Mi'kmaq
Reference	https://www.youtube.com/playlist?list=PLrYSgUdkojydtxldkctB3nDUiCenOMlqx https://www.facebook.com/savvyunltd/
Brief Description	Savannah 'Savvy' Simon is a motivational speaker and youth leader from the Mi'kmaq tribe of Elsipogtog First Nation, NB. She currently makes her home in Halifax, NS while routinely inspiring audiences throughout North America. An educator, entrepreneur, activist, mentor and entertainer--she is widely respected as a passionate and genuine presenter with a powerful gift for inspiring and engaging diverse audiences of all ages. Understanding the importance of language to a culture's survival, Savvy has embraced social media as a tool for the launch of her Mi'kmaq Language Revolution. A prolific YouTuber and frequent contributor to Twitter and Instagram, she has created an online community with her signature hashtag, #SpeakMikmaq. Through her growing library of instructional videos, she has helped revitalize her native language by making it fun and accessible for learners of all ages. Encouraged by her work, the language hashtag movement has been adopted and emulated by an increasing number of tribes throughout North America.

Title	**Shki-nishnaabemjig**
Region	Canada
Language Group	Anishinaabemowin
Reference	https://www.facebook.com/shki.nishnaabemjig/home
Brief Description	Shki-nishnaabemjig is a 3-week immersion course, offered in July, for adult language learners of Anishinaabemowin to gain a higher level of speaking proficiency. Our mission is to provide Anishinaabemowin immersion and grammar instruction for adult learners in order to preserve the language to future generations of Anishinaabeg.

6. Examples of Indigenous Organizations and Businesses Online

Title	**First Nations Technology Council**
Region	British Columbia
Language Group	Coastal First Nations
Reference	http://www.technologycouncil.ca/
Brief Description	The First Nations Technology Council was mandated in 2002 to ensure that all 203 First Nations communities in BC have access to the Internet and the capacity to utilize digital technologies to the fullest potential. In addition to advancing personal, professional and academic goals, digital technologies also allow us to advance our efforts locally, regionally, provincially and nationally in Aboriginal Rights and Title, jurisdiction and self-determination. Revitalization and preservation of language and culture are one of our mandates.

Title	**First Nations Education Council**
Region	Quebec
Language Group	Quebec First Nations
Reference	http://cepn-fnec.com/index-eng.aspx
Brief Description	The FNEC is an association of First Nations and communities, whose common purpose is to achieve full jurisdiction over their education. This will be accomplished

	through mutual collaboration, and in providing mandates to the Education Secretariat in Assembly, to support, promote, inform and defend the interests and actions of members in regards to matters of education while respecting their unique cultural identities and common beliefs, and promoting their languages, values, and traditions. Twenty-two First Nations communities in Quebec are represented by a regional organization that defends their interests and supports them in achieving complete jurisdiction over their education. The First Nations Education Council (FNEC) supports them in implementing a complete education system that respects their culture, values, traditions and identity in a spirit of mutual collaboration.

Title	**Manitoba First Nations Education Resource Centre Inc. (MFNERC)**
Region	Manitoba
Language Group	Manitoba First Nations
Reference	http://mfnerc.org/
Brief Description	Established in 1998 by the Assembly of Manitoba Chiefs, the Manitoba First Nations Education Resource Centre Inc. (MFNERC) provides the province's leading education, administration, technology, language and culture services to First Nations schools in Manitoba. The AMC established MFNERC through resolution to provide coordinated second and third level education services to Manitoba's First Nations schools. To date we provide services and support to 58 First Nations schools from 49 Manitoba First Nations.

Title	**Ogoki Learning Systems Inc.**
Region	Canada and the U.S.
Language Group	Multi-languages
Reference	http://www.ogokilearning.com/
Brief Description	Ogoki Learning Inc is a 100% First Nations owned and operated company. We specialize in the design of rich applications that engage the youth audience and provide educational value with utility. We have over 16 years experience in developing mobile utilities from the days of text message commerce integration to our first experimental geo-based game app for the HP iPAQ using locative media. Not straying too far from our roots – we now use intelligent technology to develop the next generation of smart phones utilities and mobile learning tools. Ogoki Learning Inc is developing a suite of new enriched media tools focused on enhanced learning. Our software is designed to bring educators and students together. We also provide digital media conversion services for books and existing software that helps to enhance digital learning technology into the classroom. "One of our goals is to preserve and strengthen the ancestral heritage of Canada's First Nations, Inuit, and Métis people." We focus on making meaningful software and educational iPhone apps, client training, and business consulting. Ogoki Learning Systems Inc. specializes in the training and technical app development.

7. Other Sites with Indigenous Language and Culture Information

Title	**Four Directions**
Region	Canada
Language Group	M'ikmaq, Mohawk, Ojibwe, Cree, Blackfoot
Reference	http://www.fourdirectionsteachings.com/index.html

Brief Description	The Four Directions Teachings provides digital audio and visuals of the creation stories of the of the original nations of North America: Mi'kmaq, Cree, Blackfoot, Mohawk and Ojibwe. The web site was completed in 2015.

Title	**Institute for Integrative Science & Health**
Region	Canada
Language Group	national
Reference	http://www.integrativescience.ca/activities
Brief Description	The team at the Institute for Integrative Science & Health (IISH) defines bringing together Indigenous ways of knowing and Western scientific knowledge. Science is viewed in a broadened and culturally inclusive way which is: science =dynamic, pattern-based knowledge shared through stories about our interactions with and within nature. Note: The institute for Integrative Science & Health closed in June 2013, the website continues to be maintained. The Institute for Integrative Science & Health was located at Cape Breton University in Sydney, Nova Scotia,

Title	**Mi'kmaq Debert Cultural Centre (MDCC)**
Region	Mi'kmaq Territory
Language Group	Mi'kmaq
Reference	http://www.mikmaweydebert.com/home/
Brief Description	Access to curriculum resources developed by a distinguished group of Mi'kmaq educators. Download 'Mi'kmawe'l Tan Teli'kina'muemk Teaching About Mi'kmaq' a resource designed for anyone who teaches Mi'kmaq history, culture and knowledge. Through the stories and knowledge of Mi'kmaq Elders, educators, and other experts for graders primary to nine.

Title	**The N'we Jinan Tour**
Region	Eastern Canada
Language Group	Algonquian
Reference	http://nwejinan.com/ https://soundcloud.com/nwejinan
Brief Description	N'we Jinan is a nonprofit organization that brings a mobile recording studio into schools and community centres across North America. The program is aimed to create an environment where Indigenous youth can express themselves musically and creatively under the guidance of a professional music producer. Creating original digital musical and visual works that encourage collective community voice and cultivating identity through youth educational programs that give young people a chance to be heard through an online sharing platform built for social impact and justice.

Title	**Pjilasimikmaki – welcome to mi'kma'ki**
Region	Canada Council for the Arts – Conseil des arts du Canada
Language Group	Mi'kmaq
Reference	https://pjilasimikmaki.wordpress.com
Brief Description	Podcast episodes, a bilingual Mi'kmaq/English podcast hosted by Annie Clair from Elsipogtog First Nation NB, they include: Episode 1: Pjilasi Mi'kma'ki, we heard about the 'sixties scoop', where Aboriginal children were stripped from their families and placed into non-native homes. Sixties scoop was also an attach on language. / Episode 2: On Language and Education. Mi'kmaq language is threatened by the legacy of colonialism, from residential schools to the modern education curriculum. / Episode 3: Wrestling with the Reserve System / Episode 4: The Power of Words / Episode 5: The human side of the inquiry / Episode 6: All about Ligpenigen (Baskets) / Episode 7: The time machine / Episode 8: The title and treaty show

Title	Mi'kmaw Spirit
Region	Atlantic provinces
Language Group	Mi'kmaq
Reference	http://www.muiniskw.org/index.htm
Brief Description	Created in order to give people a reliable place to find accurate information about Mi'kmaq people and their culture, their history, and their spirituality.

Title	Muskrat Magazine.com
Region	Canada
Language Group	National
Reference	http://muskratmagazine.com/author/muskratmagazine/
Brief Description	MUSKRAT is an online Indigenous arts, culture magazine that honours the connection between humans and our traditional ecological knowledge by exhibiting original works and critical commentary. MUSKRAT embraces both rural and urban settings and uses media arts, the Internet, and wireless technology to investigate and disseminate traditional knowledges in ways that inspire reclamation.

Title	Statistics Canada
Region	Canada
Language Group	National
Reference	https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-011-x/99-011-x2011003_1-eng.cfm
Brief Description	National Household Survey - This is the first release of data from the National Household Survey (NHS). Roughly 4.5 million households across Canada were selected for the NHS, representing about one-third of all households.

Title	First Nations Education Steering Committee (FNESC)
Region	British Columbia
Language Group	Coastal languages
Reference	http://www.fnesc.ca/programs/first-nations-languages/
Brief Description	The First Nations Education Steering Committee (FNESC) was founded in 1992 by participants at a provincial First Nations education conference at the Vancouver Friendship Centre. That visionary group of people determined the need for a First Nations-controlled collective organization focused on advancing quality education for all First Nations learners, and they set out FNESC's commitment to supporting First Nations in their efforts to improve the success of all First Nations students in BC.

Title	Wawatay Native Communications Society
Region	Northern Ontario
Language Group	Cree, Oji-Cree, Ojibway
Reference	http://wawataynews.ca/
Brief Description	The Native Communication Societies across Canada used to do lots of great work in language radio and television programs. A lot of the dollars now flow to APTN but some groups like Wawatay Native Communications Society still produces their material and have moved into an online digital format.

Title	KWAYACIIWIN Education Resource Centre
Region	Northern Ontario
Language Group	Oji-Cree, Cree, Ojibway
Reference	http://kerc.ca

Brief Description	Kwayaciiwin Education Resource Centre is a respected, First Nation, community-driven, sustainable Centre of Excellence. We provide comprehensive support systems to ensure learner success, while providing a bilingual and bicultural program.

Title	**Kenjgewin Teg Educational Institute Culture and Language Links**
Region	Canada
Language Group	Algonquian
Reference	http://www.fnssp.com/website-links3.html
Brief Description	Kenjgewin Teg Educational Institute is an Indigenous and Northern Affairs Canada funded First Nations Success Students Program recipient. Their web site has a number of the sites included in this appendix along with several additional language and culture digital resources.

Title	**Language Gathering**
Region	International
Language Group	Indigenous languages from around the world
Reference	http://www.languagegathering.org/
Brief Description	Cultural Survival's inaugural Endangered Languages Program-planning session hosted by the Sac and Fox Nation of Oklahoma's Language Department in Stroud, Oklahoma, in 2007. This website is a tribute to and platform connecting surviving Indigenous language communities of North America (within the United States, initially) and the many hundreds of community-based language projects they've inspired. This permanent resource will expand to profile and connect Indigenous language revitalization efforts underway globally. Site organizes the various digital resources into the following categories: Language Programs, Best Practices, Teaching/Learning Resources, Find Funding, and Language Jobs.

Title	**Online NEWS Stories**
Region	Canada
Language Group	National
Reference	http://www.cbc.ca/news/indigenous https://news.vice.com/article/indigenous-languages-are-dying-in-canada-heres-how-people-are-trying-to-save-them
Brief Description	Lots of digital news stories about Indigenous languages and culture resurgence. The CBC Aboriginal web site is good starting place to conduct searches for stories. The 2016 VICE NEWS story by Meagan Wohlberg, "Indigenous languages are dying in Canada. Here's how people are trying to save them" contains a number of references about activists doing the work required to protect their languages.

Title	**Ethnologue: Languages of the World**
Region	International
Language Group	Multiple languages
Reference	https://www.ethnologue.com
Brief Description	Ethnologue: Languages of the World is a comprehensive reference work cataloging all of the world's known living languages. Since 1951, the Ethnologue has been an active research project involving hundreds of linguists and other researchers around the world. It is widely regarded to be the most comprehensive source of information of its kind. The information in the Ethnologue will be valuable to anyone with an interest in cross-cultural communication, bilingualism, literacy rates, language planning and language policy, language development, language relationships, endangered languages, writing systems and to all with a general curiosity about languages.

Title	Technology-centric Online Stories for Language Revitilization
Region	International
Language Group	Multiple languages
Reference	http://kosu.org/post/technology-creates-new-opportunities-language-revitilization#stream/0
Brief Description	ALLISON HERRERA's 2016 online story "Technology Creates New Opportunities For Language Revitilization" is one example of the type of online stories containing multiple examples supporting this position. A google news search using key words identifies multiple stories.

Title	Native American Languages Collection
Region	North America
Language Group	Multiple languages
Reference	http://samnoblemuseum.ou.edu/collections-and-research/native-american-languages/
Brief Description	The Native American Languages Collection at the Sam Noble Museum represents over 175 languages and provides invaluable reference material to researchers, educators and students. The collection and activities sponsored by the department are aimed to preserve valuable linguistic resources, support language retention and revitalization, celebrate linguistic diversity and further the intellectual heritage of these languages.

Title	Indigenous Language Curriculum Development
Region	International
Language Group	Multiple languages
Reference	http://www.maei-ieam.ca/ http://www.esperanzaeducation.ca/blog/resources/curriculum-development-for-indigenous-languages
Brief Description	Developing appropriate digital resource materials for Language and Cultural resurgence involves many partners and allies. Many digital examples exist on various sites. The Martin Aboriginal Education Initiative's Promising Practices monthly newsletter lists hundreds of examples of Language and Cultural curriculum resources in their archives at http://www.maei-ppw.ca/. The Esperanza Education blog documents some of the important considerations in producing appropriate resources.

Title	Canadian Indigenous Languages and Literacy Development Institute (CILLDI)
Region	National
Language Group	Multiple languages
Reference	http://www.cilldi.ualberta.ca/ https://en.wikipedia.org/wiki/Canadian_Indigenous_Languages_and_Literacy_Development_Institute
Brief Description	CILLDI hosts an annual summer school at the University of Alberta. It is dedicated to the revitalization of Canada's Indigenous languages through documentation, teaching, and literacy. Our purpose is to support individuals at the community level by providing basic training in linguistics, native languages, second language teaching, and other aspects of professional enhancement such as language-related research and policy making. They are involved in developing a national archive of Indigenous language and cultural resources.

Title	American Indian Language Development Institute

Region	Americas
Language Group	Multiple languages
Reference	http://aildi.arizona.edu/
Brief Description	American Indian Language Development Institute (AILDI) offers a sustained Indigenous language education experience to hundreds of students, community members,educators, scholars, researchers and language advocates. AILDI's mission is to provide critical training to strengthen efforts to revitalize and promote the use of Indigenous languages across generations. This is accomplished by engaging educators, schools, Indigenous communities and policy makers nationally and internationally through outreach, transformative teaching, purposeful research and collaborative partnerships. As a result of our work, we envision that the larger society will know that language revitalization is critical to sustain and reinforce Indigenous linguistic, cultural, and spiritual health and identity.

Title	Journal: Language Learning & Technology (LLT)
Region	International
Language Group	Multiple languages
Reference	http://llt.msu.edu/
Brief Description	Language Learning & Technology (LLT) is a refereed journal that began publication in July 1997. LLT disseminates research to foreign and second language educators worldwide on issues related to technology and language education. The journal is sponsored and funded by the University of Hawai'i National Foreign Language Resource Center (NFLRC), University of Hawai'i Center for Language and Technology (CLT), and the Michigan State University Center for Language Education and Research (CLEAR). The focus of the publication is not technology per se, but rather issues related to language learning and language teaching, and how they are affected or enhanced by the use of technologies. Back and current issues of the journal are available online.

Title	Native Languages of the Americas
Region	North America
Language Group	Multiple languages
Reference	http://www.native-languages.org/
Brief Description	Small non-profit organization dedicated to the survival of Native American languages, particularly through the use of Internet technology. The site is a compendium of online materials about more than 800 indigenous languages of the Western Hemisphere and the people that speak them.

Title	Gift of Language and Culture Website
Region	Northern Saskatchewan
Language Group	Cree
Reference	http://www.giftoflanguageandculture.ca/
Brief Description	The Gift of Language and Culture Website is an Aboriginal language site developed by the Lac La Ronge Indian Band (LLRIB) Curriculum Resource Unit (CRU). The language site's focal point is on Instructional Curriculum development for Nursery to Grade 9. There are many other features such as, Native stories, songs, and talking pictures. Native language Vocabulary Exercises are available in Flash for people of all ages to learn Cree TH, Y, or N dialect and even Dene. The site features Aboriginal language Resources for use in schools or at home. Several of these resources have been enhanced in Flash as Audible Resources for easy learning. A Photo Gallery displays several albums featuring nature, people, and various activities. Videos presenting northern people are available in wmv and YouTube format. A feature has

	been added to accommodate syllabic learners: Syllabic Matching Quizzes, where a learner drags and drops syllabic symbols to the appropriate text box.

Title	**Omushkego Oral History Project**
Region	Northern Ontario
Language Group	Cree
Reference	http://www.ourvoices.ca/
Brief Description	In Aboriginal culture, teachings are passed from generation to generation in a rich tradition of storytelling. Join the University of Winnipeg's Centre for Rupert's Land Studies and Louis Bird, Aboriginal scholar and storyteller work together as part of the Omushkego Oral History Project. Bird shares - in Cree and in English - a sampling of the stories of the Omushkegowak or "Swampy Cree" people of the Hudson and James Bay Lowlands of northern Manitoba and Ontario. Bird is from Peawanuck Ontario. He shares traditional Cree legends, mystery stories, and oral history.

Title	**Indspire Successful Practices**
Region	Canada
Language Group	Multiple languages
Reference	http://indspire.ca/for-educators/successful-practices/practices/
Brief Description	Reports on various Indigenous education programs, organizations and success stories including several language initiatives.

Title	**Language Revival**
Region	Atlantic coast
Language Group	Passamaquoddy
Reference	http://www.languagerevival.com/
Brief Description	Innovative approaches for preventing and reversing heritage language decline and loss.

Title	**Tradition & Transition project**
Region	Labrador
Language Group	Innu
Reference	http://www.traditionandtransition.com/english/about_mandate.htm
Brief Description	Tradition & Transition is a five-year partnership between Memorial University of Newfoundland and the Nunatsiavut Government, which represents the Inuit of Labrador. The goal of the partnership is to strengthen both traditional Inuit knowledge and the research being done in Nunatsiavut, in order to ensure the continuing vitality of Labrador Inuit culture.

Title	**YouTube Indigenous Language videos**
Region	International
Language Group	Multiple languages
Reference	http://youtube.com https://www.youtube.com/watch?v=l8PlKr1NYpg
Brief Description	A search of the YouTube video website on the term "Indigenous Language" turns up 80,400 videos as of October 6, 2016. The video "Ojibwe Basics 1" is an example of the types of resources being posted on this site. https://vimeo.com listed 987 videos for the same search on its site.

Title	**Virtual Museum of Canada – New Brunswick Museum**

Region	New Brunswick
Language Group	Wolastoqey
Reference	http://website.nbm-mnb.ca/Koluskap/English/index.php
Brief Description	Experience a journey with the warmth of Wolastoqiyik. In the beginning of our journey to our Mother the Earth, Wolastoqiyik came with a gift like all cultures of the medicine wheel. The First Nations gift is that we are the caretakers of our Mother the Earth and all the lives within her. The gift is to share, respect, honour and love all life on our Mother the Earth. Any individual cannot own Mother Earth and all that lives within her. Our Wolastoqew presentation is a gift to you, to share with all, and to encourage an understanding and relationship between cultures and language that offers the most compelling reason to conserve all of our cultures. We must all share the gifts we came here with, and then we will all obtain the highest potential to be a people of one.

Title	**Wôpanâak Language Reclamation Project**
Region	Atlantic – United States
Language Group	Wôpanâak
Reference	http://www.wlrp.org/home.html
Brief Description	The Wôpanâak Language Reclamation Project (WLRP), a 501(c)3 nonprofit organization registered with the Commonwealth of Massachusetts as the Wôpanâak Language and Cultural Weetyoo, Inc., has partnered with tribal families and the Montessori Academy of Cape Cod to open an immersion school in 2016, Mukayuhsak Weekuw: The Children's House.

Title	**Sealaska Heritage Centre**
Region	Alaska
Language Group	Multiple Pacific coastal languages
Reference	http://www.sealaskaheritage.org/
Brief Description	Sealaska Heritage is a regional Native nonprofit organization. Our mission is to perpetuate and enhance Tlingit, Haida and Tsimshian cultures. Our goal is to promote cultural diversity and cross-cultural understanding. We offer numerous programs promoting Southeast Alaskan Native culture, including language and art. We maintain a substantial archive of Southeast Alaskan Native ethnographic material. We partner with local schools to promote academics and cultural education. Biennially, we produce Celebration, Alaska'™s second-largest Native gathering.

Title	**Ojibway and Cree Cultural Centre**
Region	Northern Ontario
Language Group	Cree, Oji-Cree
Reference	http://www.occc.ca/
Brief Description	The Ojibway and Cree Cultural Centre is a non-profit organization that was established in 1975 under the direction of Grand Council Treaty #9, now known as the Nishnawbe Aski Nation (NAN). The Centre is funded through Indian and Northern Affairs Canada (INAC) Cultural Education Centres program. The Centre is managed by a board of directors who represent each Tribal Council area of the NAN territory. The centre is a member of First Nations Confederacy of Cultural Education Centres (FNCCEC) – http://fnccec.ca, where links to other Indigenous cultural centres can be found.

Title	**Ojibwe Cultural Foundation**
Region	Northeastern Ontario

Language Group	Algonquian
Reference	http://www.ojibweculture.ca/
Brief Description	Since its creation in 1974, the OCF has empowered all Anishinaabek to strengthen our language and culture. We create much needed language learning resources for use in schools and homes. We work with our Elders and wisdom keepers to make traditional customs and ceremonies a part of our daily lives. We nurture and help Anishinaabe visual artists share their unique vision with the world.

Title	**Inuit Tapiriit Kanatami**
Region	Inuit region
Language Group	Multiple Innuit languages and dialects
Reference	http://itk.ca
Brief Description	Inuit Tapiriit Kanatami (ITK) is the national representational organization protecting and advancing the rights and interests of Inuit in Canada. There are four Inuit regions in Canada, collectively known as Inuit Nunangat. The term "Inuit Nunangat" is a Canadian Inuit term that includes land, water, and ice. Inuit consider the land, water, and ice, of our homeland to be integral to our culture and our way of life. Government information about the four Inuit regions working ITK can be found at http://www.aadnc-aandc.gc.ca/eng/1100100014187/1100100014191

Title	**First Nation Profiles Interactive Map**
Region	National
Language Group	Multiple languages
Reference	http://fnpim-cippn.aandc-aadnc.gc.ca/index-eng.html
Brief Description	The First Nation Profiles is a collection of information that describes individual First Nation communities across Canada. The profiles include general information on a First Nation along with more detailed information about its reserve(s), governance, federal funding, geography, registered population statistics and various Census statistics. The interactive map includes the regional First Nation councils supporting the First Nations. Community and their Council web sites are available when they exist. These community and regional sites are great resources describing community efforts to protect their local languages and culture.

Title	**First Nation Political Organizations**
Region	National
Language Group	Multiple languages
Reference	http://fnp-ppn.aandc-aadnc.gc.ca/fnp/Main/Search/SearchPO.aspx?lang=eng
Brief Description	List all First Nation political organizations funded by the federal government's Indigenous and Northern Affairs Canada. The national organization representing First Nations is the Assembly of First Nations (http://afn.ca).

Title	**Ojibwe People's Dictionary**
Region	Canada and U.S.
Language Group	Ojibwe
Reference	http://ojibwe.lib.umn.edu/en
Brief Description	The Ojibwe People's Dictionary is a searchable, talking Ojibwe-English dictionary that features the voices of Ojibwe speakers. It is also a gateway into the Ojibwe collections at the Minnesota Historical Society. Along with detailed Ojibwe language entries and voices, you will find beautiful cultural items, photographs, and excerpts from relevant historical documents. Whenever possible, we provide examples of documents in the Ojibwe language.

Title	**Kanien'keha Endangered Language Initiative**
Region	Ontario and Quebec
Language Group	Mohawk
Reference	https://kanienkeha.net/
Brief Description	Literacy is a fundamental human right and the foundation of personal empowerment and a means for social and human development. It is fully essential to social and human development in its ability to transform lives. Literacy is at the heart of basic education for all, and essential for understanding the Kanienkehaka Social Condition, Modern Identity and Youth. Improved use of language portals for greater language equality and ensuring sustainable development, peace and democracy. For individuals, families, and societies alike, it is an instrument of empowerment to improve one's health, one's heritage, and one's relationship with the world.

Title	**#indigenouslanguages**
Region	International
Language Group	Multiple languages
Reference	https://twitter.com/hashtag/indigenouslanguages?src=hash
Brief Description	Twitter.com has a number of hash tags with news stories and links to resources. #SpeakMiKmaq is another example