

Elder Perspectives: LEVERAGING DIGITAL TOOLS IN LANGUAGE REVIVAL
INITIATIVES

Elder Perspectives:
Leveraging Digital Tools in Language Revival Initiatives

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An oral defense of this thesis took place on December 2, 2019, in front of the following examining committee:

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The above committee determined that the thesis is acceptable in form and content and that a satisfactory knowledge of the field covered by the thesis was demonstrated by the candidate during an oral examination. A signed copy of the Certificate of Approval is available from the School of Graduate and Postdoctoral Studies.

Abstract

Elders are held in high regard in First Nations, Metis, and Inuit (FNMI) communities. They are the intergenerational transmitters of ancestral language and Indigenous knowledge. Without language revival initiatives, ancestral languages in FNMI communities are at risk of extinction. Leveraging digital technologies while collaborating with Elders can support revival initiatives. Through semi-structured interviews and qualitative analysis, this study addresses how three Elders who use technology in their ancestral language teaching (1) describe the benefits, drawbacks, and preferences of technology; (2) reveal the accuracy with which cultural knowledge is imparted through technology; and (3) view the impact of technology on their role as traditional knowledge keepers and intergenerational language transmitters? Findings suggest that while Elders acknowledge the benefits when leveraging digital tools in language revival initiatives, they have concerns about technology's potential negative impacts on relationality [culture, spirituality, and medicine practices], a concept I have termed *guarded optimism*.

Keywords: language revival; digital technology; guarded optimism; FNMI; Elders

Authors Declaration

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Statement of Contributions

I hereby certify that I am the sole author of this thesis and that no part of this thesis has been published or submitted for publication. I have used standard referencing practices to acknowledge ideas, research techniques, or other materials that belong to others. Furthermore, I hereby certify that I am the sole source of the creative works and/or inventive knowledge described in this thesis.

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Chapter 1

Introduction

Just as DNA is the material of heredity, language is the DNA of culture (Skutnabb-Kangas, 2002, p.539).

The inextricable link between language and culture is at the heart of this study, which considers the use of digital technologies in the revival of Indigenous languages. Costa (2013) presents a different academic perspective stating that there are more pressing matters than language revival. Although socio-economic inequities and injustices are pressing matters, addressing language revival efforts without acknowledging the reflexive relationship between culture and language would be limiting. Exploring how Elders are currently leveraging technology to revive their ancestral languages, while addressing the embedded cultural, social, and spiritual practices, help create a framework from which to consider digital language learning and teaching.

Research with Indigenous communities requires honouring cultural practices and an awareness of colonial history. I conducted this research through an Anglo-Canadian lens. As I am not privy to the experiences, culture or history of First Nations, Metis, and Inuit (FNMI) peoples, it is critical to note that the research is influenced by my settler worldview.

I was raised in a rural Anglo-Canadian home in Southwestern Ontario, attended the United Church's Sunday school each week, and received my early education at a small rural elementary school, surrounded by people who looked like me, namely Caucasian. As I grew up and listened to the conversations of the adults around me, I learned of places called "the Rez" or

“the reserve” where “the Indians live.” It piqued my curiosity; I wondered how a whole other world could be so close by, and yet I had met none of these children. Throughout secondary school, my experiences were with other families and friends of European descent. I grew up sheltered from any world different from mine. Upon reflection, much of the discussion growing up around Indigenous communities was based on misinformation and stereotypes, conversations I could not yet comprehend.

Early education in elementary school afforded me caring, loving, and encouraging educators. However, during my elementary and secondary school years, I did not learn about residential schools or the appropriation, assimilation, and atrocities or other horrors that took children, culture and language away from Indigenous families. It was not until I attended my first course in Native Studies at Trent University that I learned a significant part of North American history was omitted from the texts and lessons in my education.

I embarked on a journey through my university career to learn, listen, and acknowledge the social injustices that continue to affect remote, urban, and suburban FNMI families. Through my Bachelor of Education program at Lakehead University, I learned the important roles of the land, storytelling, and experiential learning in Indigenous education. I took this knowledge with me on my first teaching assignment to Nunavut.

Living and teaching in Nunavut influenced my perspective more than I could have imagined. For the first time, I experienced the hospitality of an Inuit community. The struggles of students and families sharply contrasted the sense of community desperately trying to keep their culture and language.

It is important at this point to say that I do not present my research to ease my colonial guilt. I engage in this research with a social justice lens to explore the injustices associated with

language attrition in Indigenous communities. British empire-building also impacted my Scottish heritage and ancestral Gaelic language, and thus I have, albeit limited, personal experience of the legacy of colonialism. My history, personal and socio-cultural influences are essential factors in considering my decision to undertake this research and the design, analysis, interpretation and the conclusions drawn from the data.

Foundational and contextual knowledge, which formed the basis for the research design, analysis and conclusions drawn from the data are outlined in sections 1.1 - 1.4. These sections include: definitions; overview; the research goals; rationale; and research questions addressed in this thesis.

1.1 Definitions

I define key terms below in alphabetical order to provide some clarity, transparency, and to guide the reader.

Anishinaabemowin & Ojibwe/Ojibway: These terms are used interchangeably, depending on the article cited and the transcripts of the participants. Referring to an Indigenous language in the Algonquian family, the morpheme ‘mowin’ means language (Pheasant, 2019), whereas Ojibwe, Ojibway, and Anishinaabeg can mean the people of the language. Anishinaabemowin, the word for the language, is derived from Anishinaabeg (Bishop, 2008).

Clan: For this study, I have used the definition of clan as offered by Gadacz (2006): “Clan has been used to designate social groups whose members trace descent from either male or female ancestors. For the Indigenous people in Canada, the term has been used most often to designate groups based on unilineal descent. This means that a person belongs to the clan of either parent. Examples of matrilineal societies, those tracing descent from a female, are the

Haudenosaunee, Haida, and Tsimshian. Clans, named after birds, fish or deer, were important in regulating marriage (usually to forbid marriage with a fellow clan member). Certain rights, privileges and property were also associated with clans, and they functioned as ceremonial units that cut across geographical and even linguistic divisions” (Gadacz, 2006, para. 1).

Culture: For this study, I have used the definition offered by Elder Bob Joseph: “Culture is the accumulated teachings of ancestors. It is the basis of traditions, customs, protocols, values, spirituality, ceremonies, language, ways of knowing and being, and connections to the land and the life-sustaining resources of the land” (Joseph, 2018, para. 2).

Elder: An Elder is an individual who holds status of high importance within the community, one with considerable knowledge of culture, tradition, and language. Elders are responsible for intergenerational transmission of culture, traditions, and language. Elder status is not based on age (i.e., elderly), and not all Elders view themselves as such [Elders] but may be viewed by their communities as having Elder status (Indigenous and Northern Affairs Canada, 2014).

European Epistemologies: These traditional European ideologies about the construct of knowledge include theories such as positivism, constructivism, and critical theory. Constructivism theorists suggest that knowledge is individually constructed based on personal experience and previous knowledge. While positivists believe that the researcher and the researched person are independent of each other, critical theorists argue that all knowledge is biased and seek to challenge established knowledge bases (Brown & Strega, 2005).

First Nations Metis Inuit (FNMI) and Indigenous: I do not use these terms to collectively group all individuals who lived or currently live on Turtle Island (colonized as North America). Instead, the terms are in keeping with current governmental and institutional policies. I recognize the term's inherent colonial and problematic origins.

Indigenous Research Paradigms: Grounded in anti-oppressive research practices, Indigenous epistemologies and research methodologies include ways of knowing that are fluid, experiential, derived from intergenerational storytelling, reciprocity and interrelationships (Brown & Strega, 2005). Wilson (2001, p.176) stated that an “Indigenous research paradigm comes from the fundamental belief that knowledge is relational. Knowledge is shared with all of creation... [It] goes beyond the idea of individual knowledge to the concept of relational knowledge.”

Language:

Language Acquisition: Krashen and Jarvis (2014) describe language acquisition as the way we learn [our first] language. In language acquisition, there is no conscious attention to form.

Language Learning: Learning a language, as described by Krashen and Jarvis (2014), involves conscious attention to the structures and rules of a language. Learning a language often occurs through formal instruction.

Polysynthetic Language: Kell (2014, p. 9) describes polysynthetic languages as languages in which several morphemes (smallest unit of meaning in the language) combine to form very long words.

Nêhiyawêwin: This term, which refers to an Algonquian language (Plains Cree) spoken by the Nêhiyawak, meaning plains people (Johnson, 2017; Wolvengrey, n.d.).

Revival: I define language revival as an attempt to restore to widespread use a language that has suffered from the shift to a dominant language. Hobson (2013) distinguishes three different levels of language revival:

1. **Revitalization:** Elders speak the language daily in the community.

Here, the goal is to extend the use of the language into the younger generations.

2. **Renewal:** Community members identify with the language, and significant amounts of linguistic heritage remain. However, the language is no longer actively spoken.

3. **Reclamation:** The community relies heavily on historical data and archives, as very little linguistic heritage remains within the community (Hobson, 2013, para. 3).

1.2 Overview

The United Nations (2004) defines Indigenous peoples as having developed pre-invasion and pre-colonial cohesion between societies developed on their territories. Canadian FNMI peoples, who are the fastest-growing non-dominant sector of the population, are determined to preserve their territories and ethnic identities for future generations through self-governance, land claims, and cultural practices (Statistics Canada, 2016). The United Nations Declaration on the Rights of Indigenous People (UNDRIP) as a whole lists the many rights of Indigenous peoples, among which is article 13, the right of Indigenous peoples to “revitalize, use, develop

and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literature, and to designate and keep their own names for communities, places and persons” (2007, p. 5). Despite this right, the threat of language loss to Indigenous cultures worldwide, including Canadian FNMI populations, is imminent without intervention.

Bruner (1990) and others (Donohue, 2016; Hinton & Hale, 2001) argue that there is an inextricable link between culture, identity, and knowledge. When a language becomes extinct, significant parts of culture, identity, and knowledge are lost. Throughout Canada, settler relations created environments that destroyed Indigenous languages and dialects. The maintenance, continuance and development of first language speakers depend upon developing and implementing language revival projects in FNMI communities and supported by allies. Research by both Indigenous and ally scholars to develop informed language learning practices while leveraging digital language learning technologies may play a supportive role in reviving endangered languages.

Learning ancestral languages using technology is an area of interest for communities, Elders, scholars, educational institutions, and government agencies invested in language revitalization projects. Leveraging digital tools to promote opportunities for language learning and revitalization of at-risk languages requires Elder input. Despite the critical role of Elders in intergenerational knowledge transmission (Osborn, 2006), the literature reveals a limited amount of research that addresses Elders’ perspectives on the role of technology in facilitating language revival. Consulting with Elders to ensure the appropriate intergenerational transmission of culture and language is an important element when leveraging technology to teach an ancestral language.

1.3 The Research Goals

Communities worldwide are growing their language revival projects to transmit traditional knowledge and culture. Investigating gaps in previous research while honouring Elder perspectives in digital language learning is crucial to this research process.

The goal of this research is to explore the views of FNMI Elders regarding the use of digital technologies to promote ancestral language revival. Collaborative data sharing and critical analyses between FNMI communities and non-Indigenous researcher allies can provide insight into best practices when developing frameworks for language revival initiatives.

1.4 Rationale and Research Questions

Previous research in ancestral language learning emphasizes the importance of intergenerational language transmission, pedagogical practices, and the benefits or drawbacks of infusing technology in language learning (Cutknife, 2018; Mishra & Koehler, 2006; Niess & Gillow-Wiles, 2013; Noori, 2011; Perley, O'Donnell, George, Beaton, & Peter-Paul, 2016; Villa, 2002; Wagner, 2017). Most Indigenous research emphasizes the integral role of Elders in developing language programs. However, when addressing the use of digital technology in Indigenous language teaching, the perspectives of Elders may be overlooked or inadequately explored. Intergenerational transmission of knowledge and language between Elders and youth is a crucial link that should be preserved.

Youth seek connections to their heritage through language and cultural practices; they long to feel a part of their clan (Bawaajigewin Aboriginal Community Circle, 2017; Gadacz, 2006; Ross, 2016). Ross (2016) addresses the role of intergenerational transmission by connecting Elders and youth in a unique experiential learning environment. Ross's study explored integrating Elders at a summer camp to promote language acquisition in youth. Although valuable, Ross's (2016) study is limited in scope. The study documented Elders'

teaching strategies and investigated the changes in young people's knowledge regarding the clan system. The educational goals and strategies were specific to the community studied. Further, Ross's study is brief, lacking longitudinal data collection and long-term outcomes.

Bawaajigewin Aboriginal Community Circle (2017), indicated that Indigenous youth in Durham region (Southern Ontario) would invest time into developing fluency in ancestral languages, yet current models of language education, such as those discussed by Babae (2012), are inadequate for developing communication skills beyond a superficial level. Elders can offer the opportunity to develop fluency through intergenerational teaching methods, including apprenticeships, 1:1 learning, and authentic on-the-land or hands-on learning opportunities (First Peoples' Cultural Council, 2016; Green, 2017; Hinton & Hale, 2001).

Few studies have explored the role of Elder input in the development and implementation of digital technologies for language revival. Integrating modern technological devices may provide a digital space to engage both youth and Elders, and could lessen the generational digital divide by infusing technology with intergenerational methods of teaching. A collaborative digital space where language learners and language teachers can leverage digital technologies to revive their ancestral language could help learners to attain fluency in their ancestral language and steer endangered languages away from extinction. However, the immediate concern is that technology is being implemented without consultation with traditional knowledge keepers and Indigenous Elders.

Some Indigenous digital language learning programs may have been developed with dominant educational frameworks and may have the potential to misrepresent cultural practices (Battiste, 2002; Perley et al. 2016). An example of cultural misrepresentation is in the software application (app) *Maskwacîs Goes to School* described by Cutknife (2018), Indigenous

Education Coordinator at Nipisihkopahk Education Authority of the Samson Cree First Nation in Hobbema, Alberta. Thornton Media Productions developed the app in collaboration with the Samson Cree Nation. While the app is engaging, it contains subtleties that misrepresent the Cree culture. Cutknife explained that in one case in the app, a woman is speaking while sitting cross-legged, but this is not how Samson Cree women traditionally sit when addressing others. Cutknife, cultural educator and advisor to the project, recalled a discussion with programmers outlining the difficulty of changing the stance of the avatar in the coding of the program. Programmers apply a standard code to language learning apps that may not fit the cultural learning context. According to Cutknife, changing the standard code to represent the culture accurately takes a significant amount of time and money. Consequently, communities must use resources that are available and affordable, despite misrepresentations in characters, settings or other cultural information (Cutknife, 2018).

Fishman (1991) suggests that marginalized and endangered cultures are especially aware of the relationship between language and culture. If cognition, culture, and language are intertwined, as claimed by Fishman and others (Bruner, 1990; Wittgenstein 1961), an individual could not participate fully in the culture without fluency in the language. Given the important role of Elders in the language revival process, I designed the following questions as a framework to guide this (thesis) investigation.

How do Elders who use technology in their language teaching:

- describe the benefits, drawbacks, and preferences of technology?
- reveal the accuracy with which cultural knowledge is imparted through technology?
- view the impact of technology on their role as traditional knowledge keepers and intergenerational language transmitters?

Chapter 2

Literature Review

2.1 Overview

Language represents the spiritual, artistic, and intellectual essences of a community and is the repository where cultures store intellectual wealth and knowledge (Warschauer & De Florio-Hansen, 2003). As Mora (2000) discusses, a fetus perceives acoustic signals that set the parameters for linguistic structures. In utero, the fetus identifies the sounds of the mother's heartbeat and responds to sensory information from outside of the uterus. Proficiency develops as individuals move from simple sentence structures in infancy and early childhood to the more complex structures of adolescence and adulthood (Saffran, 2003). The ability to use language to express oneself, be understood and understand others is an integral piece of one's self-concept.

On a global level, languages in Indigenous communities declined post-contact. Colonization, assimilationist policies, mandatory school programs and globalization killed or endangered the ancestral languages native to North America by enforcing the use of the colonial language. Safran (2014) argues that colonial *killer* languages make maintaining and developing mother-tongue speakers challenging.

French and English settlers set the parameters for linguicide in North American communities (Safran, 2014). Acknowledging the history of colonialism and its impacts within Indigenous communities is one part of decolonizing language-learning frameworks. Colonialism, residential schools, and child welfare agencies' belief and value systems are incongruent with Indigenous values and beliefs, resulting in intergenerational trauma that impacts the practice of ancestral culture, language, and spirituality.

Some argue that one's language shapes the way one perceives the world. That is to say, Anishinaabemowin speakers perceive the world differently than English, Spanish or Inuktitut speakers (Bruner, 1990; Fishman, 1994; Wittgenstein 1961). Without the parameters that allow for perception and cognition in one's ancestral language, FNMI peoples become disconnected from their culture. This underscores the reflexive relationship between language and culture.

Addressing the social justice components of language attrition brings to light the protective factors embedded in a language that contribute to one's well-being. Through this lens, it is possible to see how language accessibility, language learning, and language loss can affect mental health and well-being. Individuals who feel disconnected from their language also feel disconnected from their culture, people, and customs (Besemeres & Wierzbicka, 2007). Those who feel this disconnection often suffer from higher rates of mental health challenges and higher suicide and depression rates (Kirmayer, Simpson & Cargo, 2003).

Implementation of a language revival framework, as well as the development of policy and procedures, supports the revival process, which results in healthier individuals and communities. As the truth and reconciliation process moves forward, policy and language frameworks continue to evolve. Consultation with FNMI Elders, communities, and peoples is essential to ensure equitable ready access to authentic ancestral language learning opportunities. Uniting the expertise of Elders and traditional knowledge keepers with the younger generation's desire to learn through digital platforms is one path to reviving endangered languages.

Sections 2.2 - 2.5 address: acknowledging the history; truth and reconciliation; language endangerment; and intersecting roles.

2.2 Acknowledging the History

Familiarity with endangered language discourse is crucial in appreciating the current state of language revival efforts. As argued by Henze and Davis (1999), a relationship between culture and language exists in developing self-concepts and ethnic identities. Acknowledging how historical attempts at language extinction impacts ethnic and cultural identity beyond verbal and written communication is one piece in understanding the historical destruction and current endangerment of ancestral FNMI languages.

Pre-contact, people indigenous to Turtle Island lived in communities that flourished through cultural practices, customs, languages, governance, and spirituality. French and English colonizers arrived on Turtle Island, and colonization negatively impacted the human rights of Indigenous peoples (Reyhner, 2017). The cultural and linguistic disintegration caused by colonization forced a loss of heritage and brought waves of trauma that continue to be evident today (Wesley-Esquimaux & Smolewski, 2004). Physical and psychological violence, displacement, decades of chronic hostility, and self-destructive behaviours due to traumatic post-contact experiences destroyed once vibrant Indigenous communities (Evans-Campbell, 2008; Jackson & Chapleski, 2000; Sotero, 2006; Wesley-Esquimaux & Smolewski, 2004).

In 1884, the Canadian federal government led by Sir John A. Macdonald authorized the creation of residential schools commencing in the Canadian West where Indigenous children could receive a formal (European) education (Indian Act, 1894). In 1920, under the leadership of Robert Borden, an amendment to the federal Indian Act made education compulsory for Indigenous children as young as five at Indian Day and Residential schools (Indian Act, 1920). Nationally, these schools continued to operate in partnership with churches until 1996 (Restoule, 2013). In some cases, children, taken from their parents, were relocated to residential schools in

different provinces (Talaga, 2018). The goal of the residential school system was to assimilate children of FNMI heritage to colonial culture and religious faith through colonization tactics including: physical punishment for speaking their mother tongue; separating children by gender (including siblings and family members); stripping children of their (traditional) clothing; cutting their hair; and training children in European farming techniques (Truth and Reconciliation Commission of Canada [TRC], 2015b).

The assimilation process in residential schools created two worlds for FNMI children, namely their ancestral heritage and the imposed colonial worldview. These children were living between two worlds but not fully engaged in - or identifying with - either (Ball, 2004). This created a spiritual, communal, and linguistic disconnect for FNMI children. Consequently, children learned to suppress their mother tongue, cultures, and identities (Hansen & Antsanen, 2016; Miller, 2019; Mitchell, 2015), which created devastating ripple effects on the family unit. Intergenerational traumas resulted in the loss of family and community relationships for many residential school survivors (Hansen & Antsanen, 2016). Chief Perry Bellegarde (2017) of the Assembly of First Nations National addressed the loss of language due to residential schools and how colonialism impacted FNMI self-determination, ceremonies, and identities. Bellegarde argued that, if languages are unprotected and not revived, the residential school system will have achieved its misguided assimilationist goals.

Acknowledging the history and hardships faced in FNMI communities, the Truth and Reconciliation Commission (TRC, 2015a) details 94 calls to action addressing the exploitation, assimilation and attempted eradication of FNMI peoples. Responding to the TRC report, the Government of Ontario (2016) developed *The Journey Together Plan* that addresses the reconciliation process, creating culturally relevant and responsive justice systems, developing an

understanding of the legacy of residential schools, as well as providing resources and space to support FNMI languages, traditions, and cultural teachings.

2.3 Truth and Reconciliation

Politics, language and reconciliation are intertwined. The dominant languages and cultures, English and French, are the hegemonic forces that shape Canadian politics and, consequently, reconciliation efforts. Presently, translation in the Canadian House of Commons is provided in the two dominant colonial languages (English/French) and American Sign Language. Robert Falcon Ouellette, who spoke in his ancestral language, Cree, in the House of Commons in May 2017, was halted from speaking while addressing issues of missing and murdered Indigenous women. The Speaker of the House made a ruling on language use. If members of Parliament use a language other than English or French, they themselves must provide a translation into one of the two official languages (Hasselriis, 2017). This situation creates an unsettling juxtaposition, given that recommendations from the TRC indicate that it would give Indigenous languages the same treatment as English and French.

Section 2.3.1 summarizes current Indigenous language policies, programs, and frameworks in place in Canada.

2.3.1 Policy, programs and current frameworks.

Responding to the ongoing need for language revival policies and initiatives, the TRC of Canada called upon the federal government to implement and address 94 Calls to Action and proposed an Aboriginal Languages Act that addresses the needs of Indigenous languages in Canada. The calls to action include:

- Preservation of Indigenous languages
- Reinforcement of language rights

- Funding from the federal government for revitalization and preservation projects
- Preservation, revitalization, and strengthening of Indigenous cultures and languages to be managed by Indigenous communities and peoples
- Language initiative funding to reflect the diversity of Indigenous languages (TRC, 2015c, p. 2)

The TRC of Canada's report detailed specific calls to action addressing the history of residential school and the reconciliation process. Those outlined below specifically address language revitalization Canada-wide:

13. We call upon the federal government to acknowledge that Aboriginal rights include Aboriginal language rights.

14. 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.

15. We call upon the federal government to appoint, in consultation with aboriginal groups, an Aboriginal Languages Commissioner. The commissioner should help promote Aboriginal languages and report on the adequacy of federal funding of Aboriginal-languages initiatives.

16. We call upon post-secondary institutions to create university and college degree and diploma programs in Aboriginal languages.

17. We call upon all levels of government to enable residential school Survivors and their families to reclaim names changed by the residential school system by waiving administrative costs for a period of five years for the name-change process and the revision of official identity documents, such as birth certificates, passports, driver's licenses, health cards, status cards, and social insurance numbers. (TRC, 2015c, p. 2).

In 2016, Prime Minister Justin Trudeau addressed the Assembly of First Nations Special Chiefs Assembly, committing his government to preserving, protecting, and revitalizing Indigenous languages in collaboration with FNMI organizations (Trudeau, 2017). The House of Commons adopted Bill C-91, an act respecting Indigenous languages on May 9, 2019. As a result, they gave the Aboriginal Languages Initiative a \$5 million budget provided by the Department of Canadian Heritage to fund Indigenous organizations' revival efforts. Funding provided by the department can be used to create materials promoting language use and proficiency approaches to language learning, language camps, immersion programs, and educational language instruction (TRC, 2015b).

Restoring ancestral languages is an important component of the reconciliation process. That process can be halted when changes in legislation, policy, and funding for program initiatives are interrupted by changes in governmental power.

2.4 Language Endangerment

The goal of language revitalization is to reverse the progression towards endangerment or extinction (Mirza & Sundaram, 2016). Fishman's (1991) Graded Intergenerational Disruption

Scale (GIDS), and Lewis and Simons's (2010) Expanded GIDS (EGIDS) identify the extent to which a language is endangered based on the level of disruption in intergenerational transmission. Table 1 outlines the eight levels of intergenerational disruption in Fishman's (1991) GIDS scale, as adapted by Lewis and Simons (2010).

Table 1*Fishman's (adapted) GIDS Scale Descriptors*

Level	Description
Stage 1	Used in higher levels of government and in higher education
Stage 2	Used by the local government and the mass media in the community
Stage 3	Used by business and employees in less specialized work areas
Stage 4	Language is required in elementary schools
Stage 5	Language is alive and used in the community
Stage 6	Some intergenerational use of the language
Stage 7	Only adults beyond childbearing age speak the language
Stage 8	Only a few Elders speak the language

Adapted from "Assessing endangerment: Expanding Fishman's GIDS," by M.P. Lewis & G.F. Simons, 2010, *Revue Roumaine de Linguistique*, 55(2), 103-120.

The EGIDS scale presented in Table 2 is more detailed, an extension of the GIDS, identifying 13 levels of language interruption. The greater the number on the scale, the more significant the disruption in intergenerational transmission and the closer the language is to extinction.

Table 2*Expanded Graded Intergenerational Disruption Scale*

Level	Label	Description
0	International	The language is widely used between nations in trade, knowledge exchange, and international policy.
1	National	The language is used in education, work, mass media, and government at the national level.
2	Provincial	The language is used in education, work, mass media, and government within major administrative subdivisions of a nation.
3	Wider Communication	The language is used in work and mass media without official status to transcend language differences across a region.
4	Educational	The language is in vigorous use, with standardization and literature being sustained through a widespread system of institutionally supported education.
5	Developing	The language is in vigorous use, with literature in a standardized form being used by some though this is not yet widespread or sustainable.
6a	Vigorous	The language is used for face-to-face communication by all generations, and the situation is sustainable.
6b	Threatened	The language is used for face-to-face communication within all generations, but it is losing users.
7	Shifting	The child-bearing generation can use the language among themselves, but it is not being transmitted to children.
8a	Moribund	The only remaining active users of the language are members of the grandparent generation and older.

Table 2*Expanded Graded Intergenerational Disruption Scale*

Level	Label	Description
8b	Nearly Extinct	The only remaining users of the language are members of the grandparent generation or older who have little opportunity to use the language.
9	Dormant	The language serves as a reminder of heritage identity for an ethnic community, but no one has more than symbolic proficiency.
10	Extinct	The language is no longer used, and no-one retains a sense of ethnic identity associated with the language.

Adapted from “Assessing endangerment: Expanding Fishman’s GIDS,” by M.P. Lewis & G.F. Simons, 2010, *Revue Roumaine de Linguistique*, 55(2), 107.

The EGIDS scale can be used to categorize any known language, including languages that no longer have speakers. According to Lewis and Simons (2010, p.113), before being placed on the scale, each language is evaluated based on the following five key concepts:

1. Identity function
2. Vehicularity (the use of a language by second-language speakers in addition to its use as a first language)
3. State of intergenerational language transmission
4. Literacy acquisition status
5. Societal profile of generational language use

Intergenerational transmission is how ethnolinguistic groups produce first language speakers (Battiste, 2002). UNESCO (2017) identified nine factors to be considered when addressing the endangerment of a language, including intergenerational transmission. A single factor cannot determine if a language is endangered. The nine identified considerations are:

1. Intergenerational language transmission
2. The absolute number of speakers
3. The proportion of speakers within the total population
4. Shifts in domains of language use
5. Response to new domains and media
6. Availability of materials for language education and literacy
7. Governmental and institutional language attitudes and policies, including official status and use
8. Community members' attitudes toward their language
9. Amount and quality of documentation (UNESCO, 2017)

When first language speakers die without having passed the language to the next generation, the risk of language death increases, particularly in languages that are orally based (Norris, 2004). In Section 2.4.1, the following items are discussed: the current state of language revival in Canada; Indigenous language programming in the Canadian public K - 12 education system; adult language programs; and digital technologies in Indigenous language revival.

2.4.1 The current state of language revival in Canada.

The sense of belonging and identity is rooted in language and expressed in oral traditions, songs, prayers, and teachings (McIvor & Napoleon, 2009). Fishman (1994) wrote that the laws of culture are linguistic and that, without mastering the language, an individual cannot be a “full-fledged native or native-like” (p.86) participant in cultural acts, ceremonies, or occasions, which are an essential component of an individual’s identity. This means that without mastering the maternal language, identity and self-concept do not fully develop.

Statistics Canada (2016) reported that over 70 Indigenous languages in 12 different language families are spoken in Canada. Many are endangered with few speakers. Of the 70 languages spoken, more than half (43) have fewer than 1000 speakers (Statistics Canada, 2016). Algonquian languages appear to have the greatest chance of survival and to be more advanced in their revival process, with 175,825 total speakers in Canada (Statistics Canada, 2016). According to the EGIDS scale (Eberhard, Simons & Fennig, 2019), both *Anishinaabemowin* and *Néhiyawêwin* appear to be situated in the level 6 (threatened) to level 7 (shifting) revival stage, based on the number of fluent speakers. Both *Ojibway* and *Cree* appear to have the greatest number of speakers in the Algonquian language family, with 28,130 and 96,575 speakers,

respectively, according to Statistics Canada (2016). The second-largest Indigenous language family spoken in Canada is the Inuit language family, including Inuktitut, Inuinnaqtun, and Inuvialuktun (Statistics Canada, 2016).

In 2017, Statistics Canada (2017) reported that 7,890 students were enrolled in Indigenous language immersion programs (where all instruction is provided in the Indigenous language) Canada-wide. The number of students enrolled in regular Indigenous language programs, where the language is taught as a subject, or stand-alone course, was recorded as 49,020 students Canada-wide (Statistics Canada, 2017). These numbers show the importance of language protection and language revival, given the hegemony of colonial and global languages.

2.4.2 Indigenous language programming in the Canadian public K - 12 education system.

Babae (2012) offers a review of the literature related to ancestral language learning in Canada, noting that FNMI and minority languages taught in Canadian public education systems are offered at a minimum of 20 minutes per day in grades one to three, 40 minutes a day from grades four to eight, and as an elective course in grades nine to twelve. The programs are offered in Cayuga, Cree, Delaware, Mohawk, Ojibwe, Oji-Cree, and Oneida (Ontario Ministry of Education, 2001). Babae (2012) reasons that the time dedicated to ancestral and heritage language learning in public schools is insufficient to develop students' communicative skills. When the dominant language (English/French) is extensively spoken at home and in the community, acquisition of the ancestral language is further hindered as learners have minimal opportunities to use their ancestral language in meaningful or authentic ways outside of the classroom (Babae, 2012).

Immersion programming in pre-schools, language nests, daycares and Head Start programs provide a more intensive language environment up to 15 hours a week, as reported by the First Peoples' Cultural Council (2016). Engaging the community by combining language and recreation programming can enhance language learning outside of school hours. Programs that offer an experiential learning approach to language revival, such as summer immersion camps, learning traditional songs, harvesting, preparing and preserving meats (fish, deer, and bear) and plants, learning about regalia, drumming, and basket weaving can strengthen the language learning process (First Peoples' Cultural Council, 2016).

2.4.3 Adult language programs.

There are a variety of ways in which adult learners can study an Indigenous language. One such method is a Mentor-apprentice program (MAP). MAPs are one-to-one immersive language programs where a fluent speaker of an Indigenous language (mentor) is partnered with an apprentice learner. This model gives students an opportunity to spend a significant amount of time with a fluent speaker to develop an in-depth understanding of the language in real-life experiences (First Peoples' Cultural Council, 2016; Green, 2017; Hinton & Hale, 2001).

Adult learners may also take advantage of formal post-secondary course offerings in online and face-to-face models in a number of informal course offerings (via social media or YouTube videos). Post-secondary courses are often for college credits. Canada-wide programs are offered in many languages, including Mi'kmaq, Cree, Anishinaabemowin, Blackfoot, and Diné. Post-secondary institutions' language courses are based on the languages of the people in the region where the institution is located. Therefore the Indigenous languages offered are based on the needs of the community where the institution is located. Access to post-secondary

programs can prove challenging for individuals living in remote communities. Consequently, some universities and colleges offer distance language programs through digital platforms.

2.4.4 Digital technologies in Indigenous language revival.

The pervasive nature of digital devices and the affordances (possible uses) they provide (i.e. portability, access to a variety of language resources/speakers, or student engagement) have led communities to consider technological tools as a part of revival initiatives (Cutknife, 2018). Potential starting points to address language losses include implementing the digital language learning opportunities recommended by the TRC's Calls to Action (2015c). Digital language learning opportunities can make language learning accessible to youth and adults seeking digital approaches to developing their ancestral language (Bourget, 2016; Kaleimamoowahinekapu Galla, 2009). Digital tools such as apps, online language courses, and Facebook meet-up groups are newer avenues that support learners in learning their ancestral language (Eamer, 2014).

Digital technology has the potential to break down accessibility barriers, offering learners access to language learning opportunities across geographical distances. Despite creating a digital space for learners to access language learning classes, barriers, including internet connectivity, minimal infrastructure, and climate, exist for some communities (Osborn, 2006; O'Donnell et al., 2016; Taylor, 2018). These barriers are less problematic in larger Canadian cities and urban centers.

Integrating digital technology gives communities at risk of language loss a tool to create and then draw from an extensive language resource bank (i.e., online dictionaries). Elders have an extensive knowledge of traditional customs and practices that are encoded in the language (Hanrahan, 2008). This knowledge can support programmers in embedding culture within the

digital application (Baskin & Davey, 2015; Benally, 1994; Galla, 2009; Hinton & Hale, 2001; Meek, 2007; Norris, 2004; Ross, 2016).

North American models of language education draw on Western frameworks. Leveraging digital technologies and the extensive knowledge of Elders in the revival process requires moving away from historical/colonial models of language learning such as the audiolingual approach, the grammar-translation method, content-based language teaching, comprehension-based instruction, and form-focused pedagogy (Lightbown & Spada, 2013). The colonial structures embedded in these approaches are not representative of the intergenerational transmission of language (Fishman, 1991). Teaching polysynthetic languages, such as those spoken by FNMI peoples, requires an instructional approach that is not rooted in colonial approaches (Archibald & O'Grady, 2008).

2.5 Intersecting Roles

Current practices in Computer Assisted Language Learning (CALL) are working towards developing digital conditions that create favourable spaces for the revival of endangered and at-risk languages. Eamer (2013) presents what she calls the i4 (fourth intersection). The i4 is a space where three goals, namely leveraging technology to enhance learning, teaching languages for global citizenship and teaching for social justice, overlap with three essential components: fair access to ICT (Information and Communications Technology); CALL (Computer Assisted Language Learning); and language revitalization. The i4 is the space where opportunities to leverage digital tools in the revitalization process and deep language learning lie. Honouring the role of Elders, while using ICT, CALL, and leveraging the role of each component in the revitalization process, can move at-risk languages away from extinction. Sections 2.5.1, 2.5.2,

and 2.5.3 discuss the role of Elders, the role of technology, and the role of youth in the language revival process.

2.5.1 The role of Elders.

Not defined by age, Elders are leaders in their community, skilled in local culture and have traditional knowledge in particular areas. Although parents are the first teachers of their children, Elders are often language and cultural teachers in Indigenous communities (Ross, 2016). Held in high regard, Elders possess the spiritual leadership associated with cultural and traditional knowledge. They ensure the transmission of traditional values, principles, and teachings from generation to generation, with an emphasis on living in harmony with one another and the environment (Meek, 2007).

While continuing to maintain leadership in language, culture, and knowledge, Elders in urban centers have experienced significant changes in their roles (Baskin & Davey, 2015). However, Elders continue to stress the need for ancestral language learning as an integral piece of the reconciliation process.

Elders help youth develop an Indigenous self-identity, fluency in their language and cultural knowledge through an apprenticeship model (Jenni, Anisman, McIvor & Jacobs, 2017). The European patriarchal model created challenges and restricted the roles of Elders, specifically female Elders. Traditionally, female Elders held high status and passed on traditions, knowledge, and language (Mitchell, 2015). The displacement of women, Elders and children, as well as restrictive laws, created a system of patriarchal leaders similar to that of the European system (Bourassa, McKay-McNabb, & Hampton, 2004). Imposing European patriarchal values led to the disempowerment of Indigenous women and the destruction of FNMI societies.

Culture and language are crucial to FNMI people's resilience. While other minority language groups benefit from ongoing immigration to bolster the numbers of fluent speakers in their communities, FNMI peoples must revive their languages from within by drawing on the knowledge possessed by Elders and mother-tongue speakers (McIvor & Napoleon, 2009). Self-empowerment through language initiatives is one way in which Elders continue to preserve the language and facilitate revival (Benally, 1994; Hinton, 2010; Ross, 2016). The active role of Elders in the educational experiences of youth opens dialogue, transmitting valuable knowledge and shared history.

2.5.2 The role of technology.

Technology has thrust language learning forward by providing the means to document endangered languages, producing and distributing language learning materials, facilitating self-directed learning, and offering opportunities for blended learning through platforms such as Massive Online Open Courses (MOOCs) and Skype (Eamer, 2010). As Elders are the intergenerational transmitters of knowledge, how they view the role that technology plays in the language preservation process is valuable.

Different Indigenous groups have embraced the use of technology for language learning, with varying degrees of enthusiasm (Kaleimamoowahinekapu Galla, 2009). Researchers such as Bennett (2003) and Kitchenham (2013) warn that the use of technology for language learning should be viewed as a complementary strategy and not as a replacement for sound pedagogy. Building communities of language learners in a technology-infused context can be challenging where there is limited access to viable tools and reliable internet connection. Remote

communities have limited access to technology or have access to outdated technology, creating a digital divide between urban and remote communities (Eisenlohr, 2004).

Accessible technology allows language learning to take place through mobile apps, online MOOCs, Facebook live streams, and digital online gaming such as *Talking Games* created by Thornton Media (Jackson, 2013). Developments in streaming services have inspired an Ojibway streaming service similar to Netflix. OjibwayTV (<http://www.ojibwaytv.com/>) is a digital streaming service accessible on Apple TV that launched in 2017. It is the first of its kind to stream the Ojibway language via television programming.

Teachers and learners of endangered languages need readily accessible learning resources. Technology can support both the creation and the ‘housing’ of those materials on websites, databases or in the cloud. However, some communities do not wish to have their language documented in such a manner as language is considered sacred, and to be passed intergenerationally within the community (Adley-Santa Maria, 1997). Further complications arise when some smaller or remote communities do not have individuals, either on-site or in close proximity, who can troubleshoot technological problems. Some of these communities are not yet capable of independently addressing problems with IT and wait long periods for technical support (Villa, 2002).

Companies that create language apps and streaming services have designed a digital space that appears to bypass Elders’ traditional role in the language learning process. Although some services seek the advice of Elders in developing language apps, the apps alone can only attempt to approximate the holistic approach that Elders use in language transmission. Digital apps such as *Ogoki*, *Thornton Media Apps: Learn Cree, Speak Mohawk, Ojibwe, and Oneida*, or *Duolingo* use the target language and translate into the dominant language. Creating dictionaries

and translation tools can structure language learning in a way that resembles colonial practices. Significant differences in the grammatical structure of each language exist and make learning Indigenous languages through colonial practices unnecessarily difficult (Kaplan & Baldauf, 1997). These concerns validate the need for Elder guidance and recommendations as an essential practice in holistic approaches to language revitalization.

Inglebret, Banks, Pavel, Friedlander, and Stone (2007) argue that technology has many advantages, describing the powerful impacts of video media on language learners. Kitchenham (2013) agrees that, with technology, it is possible to harness the potential for language preservation, connecting ancestral language speakers with learners in virtual environments. Donovan (2007) further points out that Indigenous pedagogy and ICT are complementary. Indigenous pedagogies are grounded in experiential learning. Technology can promote language learning through experimentation, collaboration, and differentiation-experiential learning. By using technology, language learners and teachers can develop individualized language learning outcomes, use differentiated instruction and collaborative learning, thereby creating opportunities to deepen students' language learning (Donovan, 2007; Kitchenham, 2013; Stewart, 2002). Focusing on the maintenance of a high-quality language pedagogy as newer and more efficient resources are developed while consulting with Elders can build the foundation for leveraging technology in language revival.

2.5.3 The role of youth.

A 2017 report by the Bawaajigewin: Durham Region Advisory Council, a community in Southern Ontario, underscores the argument that youth are vital in the language revitalization process. The Bawaajigewin study identified language loss as the most prominent concern for

FNMI families in this region of Ontario. Youth who participated in the study indicated that they are seeking opportunities to practice, learn, and deepen their knowledge of their ancestral tongue and to become fluent speakers. The report concluded that a lack of language teachers in this part of Ontario is a barrier to youth learning and language fluency. Other research (Donovan, 2007; Galley, 2016; Hinton, 2010; Kaleimamoowahinekapu Galla, 2009; Kitchenham, 2013; Ross, 2016; Safran 2014) supports the Bawaajigewin study and shows that youth identify learning their ancestral language as a critical component in rebuilding their societies.

Some youth learn their ancestral language through model-apprentice frameworks (Hinton, 2010), requiring a considerable investment of time, and thus may not be the most efficient strategy, given that ancestral language speakers are ageing. In response, several communities have adopted immersion models for language learning. Chief Atahm School on the Adams Lake Indian Band Reserve in British Columbia is one such school where the ancestral language, Secwepemc, is the only language of instruction from early childhood to adulthood (T'selc'ewtqen Clleq'mel'ten/Chief Atahm School [n.d.]). Research by Ross (2016) found that Elders attested to the vital role of children and youth in language revival initiatives and the need for increased effort in targeting young people. Ross further recommends that communities seeking to preserve languages and customs need to address the critical role of youth in cultural and language development. Krauss (1998) adds to Ross's recommendations by noting that youth need to have access to adults speaking in their maternal language outside of the classroom. If ancestral languages are not spoken outside of educational institutions, technology becomes a distraction in language learning initiatives.

Chapter 3

Methodology

In this study, I used a qualitative case study methodology to explore the perspectives of FNMI Elders who are currently leveraging technology to revive their ancestral languages. The study adopts Merriam's (1998) definition of case study research in that it is an attempt to provide "an intensive, holistic description and analysis of a bounded phenomenon such as a program, an institution, a person, a process, or a social unit" (as cited in Yazan, 2015, p. 139). The three distinctive attributes of Merriam's case study methodology, as they pertain to this research, are noted below.

Particularistic. This research focuses on the particular perspectives of participants (Elders) concerning a social phenomenon (the growing prevalence of using digital tools to learn Indigenous languages).

Descriptive. This research seeks to present a rich and thick description of the Elders' perspectives via semi-structured interviews, which were then transcribed and analyzed using a grounded theory approach (Strauss & Corbin, 1990). Inductive and deductive data analysis was used to identify patterns and themes emerging from the transcripts.

Heuristic. The research goal is to extend and inform the understanding of those engaged in the discourse related to language revival and/or Indigenous worldviews.

I also observed asynchronous online Indigenous language lessons to identify best practices. The additional data sources were intended to relate the interview themes to the online teaching strategies and resources (Niess & Gillow-Wiles, 2013; Navajo Nation Language Project, 2000; Navajo Nation Language Project, 2003).

I acknowledge the unethical practices that negatively impacted research with FNMI populations and the need for transparent research practices incorporating Indigenous research methodologies. In collaborating with Elders, traditional knowledge keepers, and scholars throughout the research process, I strove to include FNMI beliefs, values, and customs along with their guidance.

3.1 Context

Smith (2012) and Wilson (2008) discussed the importance of qualitative research methodology when researching alongside Indigenous populations and cautioned that research is often met with apprehension by Indigenous communities worldwide. Historically, research conducted in FNMI communities collected data based upon Western European epistemologies and dismissed the value of traditional Indigenous knowledge (Goodyear-Ka'opua, 2013; Kovach, 2012; Smith, 2012; Wilson, 2008). FNMI community members have often been sources of data for researchers but were excluded from data analysis processes and typically not provided with the research findings. In extreme cases, data were used for purposes other than what was initially agreed upon (Smith, 1999; Wilson, 2008). Researchers are now becoming acquainted with Indigenous research paradigms, and are increasingly including communities in the entire research process, ensuring the research is beneficial and visible within the community (Smith, 1999; Smith, 2012; Wilson, 2008).

Qualitative methods (semi-structured interviews, action research, ethnography) have been used in previous studies with Elders in order to gather data that examined traditional roles, ageing, caregiving, health care, and education (Braun, Kim, Ka'opua, Mokuau, & Browne, 2014). Qualitative approaches afford researchers with opportunities to build relationships within

the community and provide Elders with opportunities to have their perspectives acknowledged through storytelling and oral traditions.

Historical experimental research designs influenced how social scientists worked with Indigenous populations, resulting in unethical practices and power imbalances between the researcher and individuals studied (Braun et al., 2014; Chilisa, 2011; Smith, 2012).

Understanding how hegemony plays a role in knowledge production and hierarchies (including political and institutional knowledge) can support researchers in thinking beyond European epistemologies to including Indigenous epistemologies in their work (Brayboy, Gough, Leonard, Roehl & Solyom, 2012; Smith, 2013; Wilson, 2001).

Researching with FNMI communities requires a paradigm shift and positive partnerships built upon transparency. I have drawn from a variety of recommendations by Wilson (2008) and Smith (2012), including:

- Engaging the Indigenous community in the research;
- Consulting with the community as part of the research process, giving an opportunity for the people to approve the research and methodologies;
- Grounding the research process in integrity and transparency;
- Sharing the research with the community;
- Demonstrating reciprocity and responsibility within the community, considering what knowledge the community will gain from the study and for whom the study is relevant;
- Listening purposefully rather than surface hearing during an interview;
- Including Indigenous ways of knowing and spirituality in the research process;
- Considering the possible favourable/adverse outcomes from the study; and

- Considering what processes are in place to support the research, the researched, and the researcher.

Many of the principles presented by Wilson (2008) and Smith (2012) align with the principles outlined in Ontario Tech University's ethics protocol for research with human participants. The principles are grounded in the government's Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, including protocol when working with Indigenous populations (Canadian Institutes of Health Research, Natural Sciences and Engineering, Research Council of Canada, and Social Sciences and Humanities Research Council, 2010).

I have used the guiding principles outlined by Wilson (2008) and Smith (2012) to develop a framework for this study. The research involved collaboration between myself and Elders with clear intentions, accountability, integrity, and transparency. I am aware that differences between the culture of the 'studied' and the 'studier' can complicate the research agenda. Elders, traditional knowledge keepers, and community members were consulted throughout the research process to ensure that hegemonic Eurocentric research paradigms did not drive this research process.

3.2 Design

I chose data collection tools to align with Indigenous values, beliefs, and research paradigms to respond to the research questions. Using the guiding principles of Wilson (2008) and Smith (2012), the design of this research study takes into account the importance of relationships in Indigenous research methodologies. Establishing relationships with community members, Elders, and traditional knowledge keepers ensures the emic viewpoint is preserved,

and provides opportunities for conversations that delve into social, personal, and lived experiences.

I sought the guidance of a traditional knowledge keeper through Baagwating, Ontario Tech University's Indigenous Student Centre to ensure the integrity and the appropriateness of the design and data collection tools. His role at the university (conducting ceremonies, and serving as an advisor/teacher on matters of traditional knowledge, culture, and language) makes him an integral and invaluable part of the university community. The Traditional Knowledge Keeper also acts as an advisor on the Indigenous Education Advisory Circle, providing invaluable knowledge and guidance in supporting research.

Purposive (purposeful) sampling was undertaken to recruit potential participants. Bogdan and Biklen (2003) describe purposeful sampling as "choosing subjects, places, and other dimensions of a research site to include in your research to enlarge your analysis or to test particular emerging themes and working hypothesis" (p. 261). To that end, referrals were obtained through the university's Indigenous Student Centre staff and associates.

Every attempt was made to follow Merriam's (1998) recommended best practices for interviewing, which include asking "good questions, [knowing which] questions to avoid, [using] probes, beginning the interview, [and building] the interaction between interviewer and respondent" (as cited in Yazaan, 2015, p143-144).

Interviewee transcript reviews, a process whereby interviewees are provided with a verbatim transcript of the interview to clarify or correct any inaccuracies (Hagens, Dobrow & Chafe, 2009), and online classroom observations served to add depth to the data. Having Elders review their transcripts ensured transparency and involvement throughout the research process. Classroom observations were cross-referenced with the transcripts of Elders to identify any

patterns or commonalities in pedagogical practices when using digital tools to teach/learn the ancestral language.

3.2.1 Participants and selection criteria.

Meeting specific criteria for inclusion in the study was essential as the research question explicitly addresses Elder views regarding digital technology use for language revival. Criteria included: Elder status with proficiency in their ancestral language and English; personal investment or interest in current language revitalization initiatives; familiarity with current technologies in language learning; the ability to meet online or in person; and a willingness to permit voice recording during the interview process. Elder status, technological knowledge, Indigenous language proficiency and language revival knowledge were all self-reported. Participants also self-reported their proficiency in two distinct ancestral languages, namely *Anishinaabemowin* (two) and *Nêhiyawêwin* (one).

I contacted the individuals referred to me through Ontario Tech University's Indigenous Centre to determine their interest in participating in the research. I provided each potential participant with a clear description of the research objectives and process. Of the 25 Elders contacted, six agreed to participate. Two of the six Elders were available for an interview during the data collection period. One additional participant indicated her interest in the study after viewing a social media post (Facebook).

3.2.2 Data collection tools.

Qualitative data collection tools provide opportunities for researchers to probe deeply in addition to gathering unanticipated responses from participants (Mack, Woodsong, MacQueen,

Guest & Namey, 2005). Data gathered for this study were derived from open-ended questioning in semi-structured interviews and asynchronous online classroom observations. A detailed table of data collection tools can be found in Appendix J.

3.2.2.1 Interview data.

Questions included in the interview process (see Appendix A) were screened for cultural appropriateness, sensitivity, and clarity by a traditional knowledge keeper and staff at Ontario Tech University's Indigenous Centre. The interview questions addressed how Elders view language revival, how they perceive their role in language revival, and their perception of how digital technology impacts the language revival process. Using open-ended questions created an opportunity for discourse regarding a variety of digital technology tools, identifying areas of strength and areas in need of change when considering digital tools in language revival projects. Two interviews were digitally recorded and transcribed; the third interview was transcribed from Facebook messenger interactions.

3.2.2.2 Asynchronous classroom observations.

Observations in two asynchronous digital language classrooms were conducted to document online pedagogical practices. I selected the courses based on the following criteria: (1) asynchronous accessibility (online and free of charge); (2) a video component where students could asynchronously see and hear the teacher; and (3) membership of the same language family, that is, *Anishinaabemowin*. The selected courses were not taught by any of the Elders in this study. It is imperative to note that the data collected through watching the asynchronous videos are supplementary to the data collected from Elder interviews. The purpose was not to analyze

the courses, rather to gather an understanding of how others (Elders and language teachers) use technology to disseminate language, knowledge, and culture.

Research by Niess & Gillow-Wiles (2013, 2015 & 2018) in a variety of learning contexts (math, language, graduate, and undergraduate) indicated that the strategies listed below should be included in asynchronous classes to create a community of learners engaged in collaboration and creating a shared knowledge base. The Navajo Nation Language Project (2000 & 2003) adopted the strategies proposed by Niess & Gillow-Wiles (2013) for their asynchronous language learning and encouraged other nations looking to revive their ancestral language to use these strategies to optimize student learning in an asynchronous environment. The strategies include:

- Making opportunities for the learner to talk;
- Expecting the learner to talk or respond (Wait Time);
- Asking questions to confirm understanding;
- Speaking in the target language – teacher and student;
- Focusing on verbs;
- Interacting in online discussions;
- Reflecting on learning; and
- Intentionally designing small and large group activities.

(Navajo Nation Language Project, 2000; Navajo Nation Language Project, 2003)

Using software such as Google Docs for small group project collaboration, a Learning Management System (LMS) for large group asynchronous discussion, Chatbox, and messaging features are just some examples of how the asynchronous classes can align with the suggested

strategies. Posting in a discussion board to give/receive feedback, and having students upload videos of themselves speaking the target language for assessment are additional methods that can be used by an asynchronous instructor to meet the requirements suggested by Niess and Gillow-Wiles (2013). Many of these features (email correspondence, discussion boards, and classroom chat features) was not measurable in my study because of teacher/student confidentiality.

Data (observational field notes) were collected from two asynchronous online “Introduction to Anishinaabemowin” courses offered by Sault College in Northern Ontario and the University of Wisconsin Eau Claire. I assessed observational field notes using the above guiding principles and a five-point Likert scale, indicating whether the principle was never, rarely, occasionally, often, or consistently observed.

3.3 Procedure

I provided the three Elders participating in the study with oral consent forms (Appendix B) to review independently. Elders were encouraged to ask questions for clarification before they gave oral consent. I sought oral consent to accommodate both the traditional practices and the university’s research ethics protocol.

Before and during the study, I informed Elders that their participation was voluntary and that they could withdraw their participation without repercussions if they felt uncomfortable or unable to continue for any reason. I informed participants that I would remove identifying factors in their interviews from the report to ensure anonymity. I made participants aware of the option to have their data removed from the study should they no longer wish to participate. Participants were informed that their data were safeguarded in a secure location, accessible by myself and my supervisor.

Two of the participants agreed to have their voices recorded and agreed to the collection of their data; the third agreed to the use of her written responses. One participant met with me online via Adobe Connect, while the second participant completed the interview via phone. The third completed the interview via Facebook chat messages. It was fitting that two of the interviews involved digital technology (Adobe Connect and Facebook chat messenger), given that my study focuses on leveraging the affordance of digital tools. The interview in Adobe Connect was digitally recorded, and the phone interview was recorded with a digital voice recorder. Upon completion of the interview, and after the interview transcription, I provided each Elder with a copy of the transcript to review their responses and ensure that the transcription represented their answers. Elders were permitted to clarify or add information to their responses to ensure accurate representation. Upon completion of the study, each participant received a copy of the study, along with their interview data.

Further data collection in the form of field note observations was completed in two Anishinaabemowin (Ojibwe) asynchronous online classrooms. I observed approximately 30 minutes of pedagogical practices in each asynchronous introductory course. An observational grid, using a five-point Likert scale, was used as the framework for documentation (Appendix G). The grid consisted of criteria drawn from the best practices list (for Indigenous online language learning) compiled by Niess & Gillow-Wiles (2013; 2018). I then compared these observations with the data collected from Elder interviews to identify pedagogical alignments between the asynchronous classrooms and what Elders reported in their interviews.

3.4 Data Analysis

Data collection was based on linguistic information and transcribed into a textual form, making thematic analysis an effective method to analyze data in this study. I chose thematic

analysis to identify overlapping themes between participants and themes that were unique in each participant's transcript (Corbin & Strauss, 2008; Joffe & Yardley, 2004).

Grounded Theory (Corbin & Strauss, 2008) provides a framework for analyzing qualitative data collected from participant interviews. I used both deductive (theory-driven) and inductive (data-driven) analyses, coding participant responses using Atlas.ti software (see Appendix C for a full list of codes and their definitions). Coding involves tags assigned to specific units of meaning in participant responses within the raw data (participant transcripts). The analysis of the codes assigned to linguistic data within participant transcripts illustrates the emergence of trends and identifies meaningful patterns in participant responses (Miles & Huberman, 1994).

3.4.1 Deductive a priori coding.

Deductive theory-driven codes were used to cross-examine the data in the transcripts. Theory-driven codes consist of a predetermined set of codes defined prior to (*a priori*) commencing an in-depth analysis of the data with the research question at the forefront (Crabtree & Miller, 1999). The a priori codes with which I analyzed the data include:

- Elder sense of threat to their roles;
- Elder comfort with technology; and
- Elder resistance to technology.

I present a full list of codes in Appendix C. The deductive codes used in this stage of analysis reflect themes and theoretical frameworks that emerged from a review of the literature. As an example, codes related to 'Elder ability and comfort in implementing technology in their language teaching practices' emerged from the work of Kaleimamoowahinekapu Galla (2009; 2018), Kral (2013), Noori (2011), and Wagner (2017). 'Elder resistance in leveraging technology

to teach their ancestral language’ was drawn from Adley-Santa Maria (1997) and Kaleimamoowahinekapu Galla (2009; 2018). ‘Reliable connectivity and access to Wi-Fi,’ and ‘available funding to implement technology in language learning and teaching’ were drawn from: Battiste (2002); Eisenlohr (2004); Kaleimamoowahinekapu Galla (2018); Kral (2013); Perley et al. (2016); and Villa (2002).

The qualitative software program Atlas.ti, which was used to analyze codes within the interview transcripts, allowed me to identify relationships between interviewees in the inductive and deductive coding sequences. Codes applied to the transcript data allowed me to include Boolean searches using the modifiers ‘and’ and ‘or’ to produce further results (i.e., Wi-Fi and access).

3.4.2 Data-driven inductive coding.

A data-driven inductive research approach allows a researcher to build concepts and begin the process of drawing hypotheses from the data (Swanson & Holton, 2005). This type of inductive analysis codes the data without trying to fit it into a pre-existing framework. Patterns are identified in the data to describe and organize observational and interview data. Boyatzis (1998) discusses the inductive coding process as recognizing a critical moment and encoding it before interpretation. The coding process organizes data to develop and identify themes (Fereday & Muir-Cochrane, 2006). By uploading the interview transcripts into the qualitative data analysis software (Atlas.ti), I was able to search for frequently appearing phrases. This enabled me to compile a list of codes (see Appendix C for a full list of codes and definitions), including: digital technology tools; comfort; funding; and preference for traditional tools.

3.5 Thematic Analysis

The primary objective of this research was to uncover Elder viewpoints on the benefits, drawbacks and preferences concerning digital technology used to revive their languages. Thematic analysis allows a researcher to analyze data gathered through interviews, field notes, and observational notes. I analyzed data in this study to identify patterns, make sense of seemingly unrelated data, and organize data into findings accessible to others. Identifying themes emerging from the qualitative interview data allows the researcher to begin to address the research questions (Lapadat, 2010).

3.6 Asynchronous Classroom Review

Asynchronous online lessons permitted me to experience and identify the similarities and differences in approaches to teaching Indigenous languages. Considering asynchronous online lessons and learning modules alongside interviewee transcripts served as a means of capturing different dimensions. The observation of the two asynchronous Anishinaabemowin (Ojibwe) language courses focused on the pedagogical analysis of the instructional strategies. As noted in Section 3.2.2.2, data collected from the asynchronous courses were supplementary to the data collected from Elder interviews.

Niess & Gillow-Wiles (2013) outlined optimal pedagogical strategies for asynchronous courses, as noted earlier in Section 3.2.2.2. An observational grid was created based on the optimal pedagogical strategies for asynchronous courses, and I assessed each course using a five-point Likert scale. I compared themes appearing in the asynchronous observational data to themes that emerged from Elder interviews.

3.6.1 Anishinaabemowin asynchronous course 1.

The first course titled, *Let's start Ojibwe*, is a language series produced for viewing online as a part of the Sault College Video Learning Series (Sault College, 2014). This course allowed participants to view language learning videos and complete asynchronous assignments. Supplementary material was offered through a paid option, which included additional asynchronous resources.

Of the 29 videos offered in the introductory course, I viewed five, totalling a viewing time of 28 minutes and 45 seconds. Each video viewed was three to seven minutes in length and viewed in full. Data collected from asynchronous classroom field notes were placed on a five-point Likert scale, then compared with the coded material from Elder interviews. The comparisons uncovered commonalities and differences between what Elders reported and what I observed in the asynchronous digital classroom environment, as discussed in Chapter 4.

3.6.2 Anishinaabemowin asynchronous course 2.

The second program reviewed was an online Ojibwe language program at the University of Wisconsin (Geniusz Makoons, 2018). The free of charge asynchronous classes consisted of archived live class videos, coursework, and supplementary materials to support self-directed learners. The asynchronous option is publicly available, permitting students to review and access material at their own pace on the university's website. This program offers 32 videos in their beginner (introductory) online course. I reviewed 27 minutes and 17 seconds of two introductory videos from the Beginning Ojibwe 1 Archive section. As with the first course, I placed data collected from asynchronous classroom field notes on a five-point Likert scale and compared it with the coded material from Elder interviews. Comparisons between what Elders reported and what I observed in the asynchronous digital classroom environment are presented in Chapter 4.

Chapter 4

Findings

4.1 Overview

This research explores the viewpoints of FNMI Elders regarding using technology to revitalize their ancestral languages. The questions presented below set the parameters for the research.

How do Elders who use technology in their language teaching:

1. describe the benefits, drawbacks, and preferences of technology?
2. reveal the accuracy with which cultural knowledge is imparted through technology?
3. view the impact of technology on their role as traditional knowledge keepers and intergenerational language transmitters?

The research questions were addressed using a grounded theory approach (Corbin & Strauss, 2008), where deductive and inductive coding processes were applied to participant interview transcripts. A robust data set was collected through triangulating common themes from the coded data in participant interviews, participant transcript reviews, as well as asynchronous classroom observations.

4.2 Interview Transcripts

Themes emerging from the inductive and deductive codes between participants were clustered by theme. Clustered themes included:

- Technophilia: enthusiasm for the use of technology to revive a language;

- Resistance (Technophobia): language teacher and Elder resistance to incorporating technology into their language learning programs;
- Spirituality, Culture, and Traditional Language learning practices: the inclusion of spiritual, cultural and historical practices of language learning in technology-infused classrooms or virtual classrooms;
- Access to current technologies, ICT, and stable Wi-Fi;
- Funding for technology and language programs; and
- Archiving and knowledge dissemination.

This information was used to explore the differences and similarities between the three participants in their language teaching experiences. Table 3 presents the clustered codes (Document Group) and the inductive and deductive codes (Code) under each cluster.

Table 3*Clustered Code*

Document group	Number of codes	Code
Technophilia	8	Access to differentiated learning experiences Clarity of digital resources Digital community Digital technology tools Games Hardware Technological tools for ease of teaching Technophilia
Resistance (Technophobia)	3	Elder resistance in utilizing technology Elder sense of threat Elder technological comfort
Spirituality, Culture, and traditional language teaching practices	4	Combining traditional teachings with technology Cultural teachings not practiced in technological platforms Preference for traditional methodologies Spirituality
Access to current technologies, ICT, and Wi-Fi	10	Access to differentiated learning experiences Connectivity Digital community Digital technology tools Games Hardware Instructor availability in the target language Internet connectivity Portability Technological tools for ease of teaching
Funding for technology and language programs	3	Cost of individual courses Funding Funding availability
Archiving and knowledge dissemination	3	Archiving Clarity of digital resources Knowledge dissemination

4.2.1 Marilyn.

Participant One, Marilyn, from Western Canada, indicated that her ancestral language is *Nêhiyawêwin* or Plains Cree, which is in the Algonquian language family. Having learned her ancestral language as a child, Marilyn now teaches it in a post-secondary setting. She noted the age of her language learners typically fell between 20 and 50 years.

Three critical themes emerged from Marilyn's interview, as generated by Atlas.ti frequency counts and represented below as percentages (Table 4a & 4b). Each percentage represents the coded data (deductive and inductive) and the frequency with which each value occurs within Marilyn's interview transcript.

Table 4a

Marilyn's Themes

Most Reported Codes	%
Technophilia	40.00
Access, use and implementation of technology in the classroom	34.55
Knowledge dissemination	10.91

Table 4b

Marilyn's Themes

Least Reported Codes	%
Funding	1.82
Combining traditional teachings with technology	5.45
Technophobia	7.27

Marilyn argued that technophilia depends on the individual language teacher. Further, she stated that making language soundbites (collected linguistic samples) available and relevant to the community and educators, rather than only maintaining them in archives, is a starting point for language revival. Using this linguistic data to create lessons in the classroom, or create games and apps (programming and coding from scratch), can be teacher-led, but does not necessarily require language teachers to be exceptionally skilled in computer programming or video creation. In cases where students have greater technological expertise than the teacher, she argued that students could take the lead role in developing digital resources. Marilyn explained that there are barriers that make accessing linguistic knowledge challenging for some communities, including collecting, archiving and having people knowledgeable in digitizing the content (i.e., digital games, digital dictionaries, apps, and media productions). She recognized that instilling students and educators with enthusiasm for leveraging technologies in the language classroom is still an area for further development. Marilyn identified that “with our teachers, people who are wanting to become language teachers, it is definite that we need to have them be skilled in terms of having a comfortableness in working online and working online games for the classroom” (personal communication, February 1, 2019).

Marilyn believes that using digital technologies to teach language is an important piece of the language revival process. She noted that leveraging digital technologies permits communities to collectively access and use their ancestral language [knowledge]. Marilyn argued that language learning in an online platform allows individuals who live at a distance from a school or traditional language teacher, to readily access language resources in digital form. This is something that was not previously available to older generations. However, barriers exist when using digital technology. Marilyn offered examples of these barriers, such as access to reliable

Wi-Fi and educational funding, and explained that funding opportunities to support digital implementation and instruction in language classrooms are limited.

With respect to reliable Wi-Fi, Marilyn described the considerable variation between communities: “I think it depends on the community like say Piikani [...]. I know a bit more about that. They have excellent connectivity within the nation and partly because of [their] work in IT. [At] our reserve in [...], there’s dead zones. So, if you go to the community hall for any community event, you’re not going to get any internet access or even any phone access. We’re not really isolated so that’s an interesting thing” (personal communication, February 1, 2019).

While the theme of funding arose in Marilyn’s interview, she strongly felt that valuing language transmission and knowledge dissemination plays a more significant role in language revival than funding for digital initiatives. She emphasized that technology is not the magic fix in the language revival process but one tool in the revival process as described below:

I don’t think [technology] can be seen like with anything as the [only] thing that’s going to help us (personal communication, February 1, 2019).

Despite the desire to drive change, equipping educators and their students with digital materials, equitable access to ICT, current technologies, and IT support is necessary. Marilyn alluded to the fact that some communities lack access to stable Wi-Fi and hardware to support learning through streaming or live online classes. Without the infrastructure and financial resources to implement technology-enhanced language learning initiatives, some communities cannot benefit fully from the affordances that digital tools can offer.

4.2.2 Shirley.

Participant Two, Shirley, from Southern Ontario, indicated her ancestral language as *Anishinaabemowin* or Ojibwe, which is in the Algonquian language family. She has taught her language for over thirty years. Shirley teaches *Anishinaabemowin* courses online and on-the-land (outdoors) at the post-secondary level. Tables 5a and 5b show themes emerging from Shirley's interview and the frequency (%) with which they appear.

Table 5a

Shirley's Themes

Most Reported Codes	%
Technophilia	32.55
Access to current technologies, ICT and Wi-Fi	30.00
Resistance (technophobia)	20.00

Table 5b

Shirley's Themes

Least Reported Codes	%
Funding for language programs	0.00
Spirituality, cultural, and traditional language-learning practices	
Archiving and knowledge dissemination	7.50
	10.00

Shirley noted that, from personal experience, the level of comfort that Elders have with technology could have an impact on how students learn. Technophilia (or technophobia), as conveyed by the teacher, can determine learning outcomes. Shirley also believes that being able

to see the language written, or a view a picture of the item as she speaks the language, supports student language learning. She reported that her comfort has developed over the years in incorporating technology. Shirley further discussed that some Elders feel uncomfortable because of their lack of familiarity with digital tools and further suggested a solution of creating a dual learning process whereby Elders share their knowledge while younger generations teach Elders to navigate new technologies.

Shirley indicated that it is essential for language teachers in the digital classroom to communicate in the ancestral language at all times. This includes communication with other (guest) teachers, students, and administrators (i.e., principals), similar to a traditional immersion classroom setting. The expectation in the digital classroom needs to be akin to that of an immersion classroom, with communication in the target language at all times. Using the target language reinforces the continual application and learning of the ancestral language.

When asked about the advantages of using technology in teaching ancestral languages, Shirley noted an improvement in her students' knowledge of the language when she presented instructional material visually (pictures and written words) and auditorily through technology (i.e. digital games and audio recordings), as the content is being presented through multiple approaches and channels.

During the interview, Shirley provided examples of how she has used technology while giving students authentic (meaningful) learning experiences in their ancestral language since embarking on her teaching career. She described speaking with youth and learning of their disengagement with respect to their ancestral language: "I don't have to learn the language -I'm Indian. You know 'I don't have to learn it' because they're homemade (they are of FNMI descent) and they don't take pride in their language, they're ashamed of it". To address the

disengagement, Shirley described interactions with youth, where she leveraged the students' interests and passions (student voice and choice) to undertake an Anishinaabemowin language project. Shirley collaborated with students and other Anishinaabemowin speakers to develop, research, and create a hockey CD for the classroom. Students used the CD to learn hockey terms in their ancestral Anishinaabemowin language, thus creating an authentic learning experience.

Shirley addressed making learning meaningful and authentic when she spoke about the youth's lack of value for their heritage and language. Shirley spoke of a student who thought if his hockey team communicated with each other in their ancestral language as they play hockey, it would make them a better team. She described the young people's desire for a meaningful way to use their language, to identify with what they are learning, and use it in everyday contexts. Shirley noted that offering learners the opportunity to include their interests (i.e. hockey) in the language program encouraged them to use the language both inside and outside the classroom.

In another example, Shirley pointed out that some teachers do not see sports as a valuable learning experience and underscored that “[t]he Ministry of Education tells us what to teach but does not tell us how students want to learn [how to engage students in ancestral language learning]” (personal communication, March 8, 2019). Shirley noted that combining technology with students' interests was challenging as the technology was less available when she began teaching in the late 1980s. Presently, digital language tools and Wi-Fi are used more frequently alongside intergenerational teaching methods to support language learners and aid teachers in lesson planning. It is important to note that Shirley spoke across the decades of her career, referring both to CDs from when she began teaching, as well as to digital games and asynchronous online programs (i.e., Learning Management Systems [LMS]) that are more commonly in use today. She noted that incorporating technology (CDs, digital games, and

presentation software) in the classroom can aid in language acquisition, engage youth and support language educators.

Elder resistance to technology (technophobia) was another emerging theme from her interview. Shirley discussed that technophobia was present when she began teaching in the late 1980s. Some resistance continues present day, particularly in Elders who are less comfortable using current technologies, social media platforms, and digital tools.

Shirley shared her personal reasons for leveraging technology in language revival:

I learned to type younger because it became useful for me to start typing. I thought this is a good tool although some of the Elders said we should not use the media or computers or things like that. I sort of went against it because I thought it was another way to keep the language (personal communication, March 8, 2019).

Although Shirley discussed the importance of leveraging digital tools to keep the language [alive], she noted that students gain the language at a different pace in the digital classroom. She compared her experiences when teaching courses on the land (outdoors / in person) and in the digital classroom, noting students enrolled in the *on-the-land course* retain and advance quicker in their language learning/application compared to those students who take courses solely online.

4.2.3 Kanzeegitimido.

Participant Three, Kanzeegitimido, completed an interview via Facebook messaging. Kanzeegitimido wrote to me via the Facebook messaging service after reading a social media post seeking participants for this study. The ancestral language spoken by Kanzeegitimido is *Anishinaabemowin* (Algonquian language family). Kanzeegitimido, who lives in Ontario and uses Facebook platforms to engage others in language learning, offers word-a-day posts, prayers,

soundbites, and songs online in *Anishinaabemowin*. She collaborates digitally with other language teachers to advance the vitality of her ancestral language.

Atlas.ti software was used to uncover the frequency of themes emerging from inductive and deductive codes within Kanzeegitimido's interview. Tables 6a and 6b show themes occurring in Kanzeegitimido's interview and their frequency counts.

Table 6a

Kanzeegitimido's Themes

Most Reported Codes	%
Archiving and knowledge dissemination Spirituality, culture, and traditional language-learning practices	26.09
Access to current technologies, ICT and Wi-Fi	21.74
	17.39

Table 6b

Kanzeegitimido's Themes

Least Reported Codes	%
Technophilia	13.04
Technophobia	13.04
Funding for language learning programs	8.70

Kanzeegitimido indicated a concern with technology addiction and the impact addiction could have on the family unit. She noted that rifts between families, friends and the community can develop as a result of too much screen time. She worries that using technology to develop language revival programs may further impact the personal connections central to language learning, acquisition, and use. She believes that using technology to implement language-

learning revival initiatives results in inaccurately comprehending the traditional, spiritual and cultural components that are embedded in the language. Kanzeegitimido described a discussion with another Elder about the relationship between technology and traditional teaching (ways of knowing):

The Elder said something to the effect of “the younger generation have always without question turned to Elders’ experiences and historical witnessing, yet today our young will contest the Elders using this technology and its accumulated knowledge as a tool of dominance over the Elders’ experiences. This technology will break the sacred circles within family and community and eventually, it will pollute the medicine ways”

(personal communication, April 17, 2019).

Kanzeegitimido spoke to using technology (i.e. the digital classroom) as a tool that, when leveraged appropriately, can be beneficial to language learning. However, when misused, technological tools can create problematic interactions between Elders and youth. She suggested that careful consideration and planning are needed when incorporating digital technology in Indigenous language instruction.

Another theme to emerge in Kanzeegitimido’s interview was her concern with the lack of spirituality conveyed through technology, which she believes to be essential in language learning. She spoke of medicine teachings and how the language is learned through these teachings. Kanzeegitimido asserted that medicine teachings online are not a good substitute for learning them relationally within the community:

Because I was raised with the oral teachings, and the art of using mind-memory connection, I will always fall back to this technique. Because technology is becoming the primary communication between many people, I will share happily any and all language

teachings. I will not share any medicine practices or teachings through the internet because one of the most valuable components of the teachings in the sacred Exchange of Spirit and Heart is involved in passing on the teachings. The Exchange of Spirit and Heart is not as effective with technology. There has to be a physical presence, a personal attendance when sacred medicine is being exchanged (personal communication, April 17, 2019).

Kanzeegitimido spoke about the connection between traditional learning and the importance of the Elder. She believes the importance of Elders is omitted when using digital means to disseminate knowledge.

A final theme to emerge from the interview with Kanzeegitimido is the changing role of the Elders as intergenerational transmitters of language. She believes that the role of the Elder has transformed with the increase in technology usage among younger generations. The Elder is held in high regard as a teacher of the language and of the spiritual and cultural knowledge that is encoded in language. Kanzeegitimido presented her belief that as individuals grow more dependent on technology than on the teachings of the Elders, Elders will cease to have the designated role of language teachers. One experience she recounted with another Elder was shared during our communication:

We don't record or document the language because there are sacred signatures, teachings in the language. This is a form of disrespect to those whom have suffered, are suffering, and whom have died to keep the language alive. The second Elder in question shared that this technology is but another tool of lessening our relationship and replacing the speaking Elders. We should not record with audio, video or written, for this weakens the minds of the people. They will become more dependent on this technology and more than

the skills, abilities of their minds. Eventually, the Elder speakers will be discarded and pushed aside out of the sacred circle, and these computers will take the place where Elders belong (personal communication, April 17, 2019).

The fear of technology replacing the role of Elders in teaching spirituality and culture is a concern for Elders in some FNMI communities who are working to revive their culture and language. Kanzeegitimido argued that technology is limited in how it can impart culture and spirituality to its learners. This is best achieved with Elders using traditional ways of intergenerational transmission.

4.2.4 Comparison of findings.

Table 7 presents overarching commonalities and themes between participants. I chose to look at each participant's interview based upon the most reported cluster codes (Table 7). The frequency count column represents the number of times a cluster appeared in the participant's interview. The column-relative section represents how often a cluster appeared in the participant's interview relative to the total number of clusters in each participant's interview. The column-relative section is expressed as a percentage.

Table 7*Participant Interview Cluster Codes*

Cluster Code	Marilyn		Shirley		Kanzeegitimido		Totals	
	Frequency Count	Column-relative						
Access to current technologies,	19	34.55%	12	30.00%	4	17.39%	35	29.66%
Archiving and knowledge dissemination	6	10.91%	4	10.00%	6	26.09%	16	13.56%
Funding for technology and language programs	1	1.82%	0	0.00%	2	8.70%	3	2.54%
Technophobia	4	7.27%	8	20.00%	3	13.04%	15	12.71%
Spirituality and culture	3	5.45%	3	7.5%	5	21.74%	11	9.32%
Technophilia	22	40.00%	13	32.50%	3	13.04%	38	32.20%
Totals	55	100.00%	40	100.00%	23	100.00%	118	100.00%

It is interesting to note that, for both Shirley and Marilyn, technophilia (40.00% and 32.50%, respectively) and access to current technologies, ICT and Wi-Fi (34.55% and 30.00%, respectively) are the two most frequently appearing clusters in the coded data whereas Kanzeegitimido focused on archiving and knowledge dissemination (26.09%) as well as spirituality, culture, and traditional language-learning practices (21.74%).

I recognize that there are several methods to analyze the data and uncover commonalities between participants. I chose to explore the word frequency to identify commonalities in the language that each participant used in their interview. Table 8, generated in Atlas.ti, includes each participant's word frequency count. By eliminating filler words (so, um, so, you know, anyway) and prepositions from the frequency count, I was able to uncover similarities in the language used by Marilyn, Shirley, and Kanzeegitimido in their interview transcripts. I entered filler words into a "stop" word list and detected by the Atlas.ti program. Each time the program encountered a filler word, it was excluded (stopped) from the frequency count.

I also chose to exclude *Elder*, *language*, *technology*, and *internet*, and all forms of the word *teach* and *learn* in the "stop" word list in order to expose potential themes in the interview transcripts beyond the vocabulary of the interview questions. Infrequently used words in each of the transcripts were eliminated when the frequency counter was set to a minimum threshold of three mentions of the same word. Setting a minimum threshold aided in identifying terms and themes emerging across participant transcripts so that all three participants needed to mention the same term at least once. I set the maximum threshold in mentioning a word to unlimited. Terms that appeared in the interview questions as used by me were removed (added to the stop list) from the final frequency count list in Atlas.ti. This was achieved by using the "search in context" tool in Atlas.ti. This tool allowed me to remove the term by searching the phrase where the term

appeared. As an example, I was able to remove the term *disadvantage* from the frequency count as it was not used by the Elders but by me in the interview questions.

Word clustering was used to identify themes and sets of words mentioned once in a participant's interview and mentioned in another participant's interview with a suffix (i.e. share, shared, shares and sharing). I recognized that terms could be further merged into clusters based upon their context. I used the *in-context* feature in Atlas.ti to blend similar terms. I decided to merge similar terms to determine if it yielded significant results (see Table 8). The original word frequency count table is included in Appendix I. Comparisons of the terminology used by each Elder are discussed in further detail in Chapter 5, Section 5.2.

Table 8*Participant word cluster frequency counts*

Word Cluster Count	Marilyn		Shirley		Kanzeegitimido		Totals	
	Frequency Count	%	Frequency Count	%	Frequency Count	%	Frequency Count	%
experience/ experiences/land/ opportunity	11	0.44%	7	0.32%	6	0.45%	24	8.51%
traditional/ knowledge/sacred /medicine	3	0.12%	1	0.05%	13	0.97%	17	6.03%
shared/sharing/ share	1	0.04%	0	0.00%	13	0.97%	14	4.96%
word/write/ written/writing		0.04%	11	0.51%	2	0.15%	14	4.96%
place/family/ home/together/ community/ communities	32	1.27%	3	0.14%	9	0.67%	44	15.60%

Word frequency data were used to reveal potential commonalities in the language used by participants. However, it did not present the compelling results I had hoped. Even after clustering common terms, adjusting for the removal of prepositions and meeting the parameters of the thresholds as mentioned earlier, significant results were not yielded. The outcomes of the word frequency count are discussed in detail in Chapter 5, Section 5.2.

To reveal additional commonalities in the transcript language between Elders, I chose to code for sentiment (positive, negative, neutral). I reviewed the context of each absolute code in the participant interviews and, using word choice (good, excellent, like, enjoy or poor, bad, unhappy, unfortunate, anxious, etc.), coded for negative, neutral or positive sentiment. I coded sentiment neutral when a negative sentiment was followed by a positive sentiment (i.e., the participant presented a [negative] problem followed up by a [positive] solution). Positive sentiment was coded when the participant used words and contextual cues such as enjoy, like, accomplish, achieve, advantage, benefit, believe, hope, encourage, excite, positive, success, thrive, trust, useful, wonderful, and worth. Negative sentiment coding included words such as bad, poor, challenging, deny, depress, deter, hate, disadvantage, dislike, discourage, frustrated, impatient, inconsistent, unavailable, and limited. I am aware that sentiment is a subjective assessment of the data. I chose to include this evaluation of participant sentiment regarding technology use in language revival as it aids in identifying attitudes and beliefs about technology's role in language revival. Table 9 below outlines codes organized by sentiment.

Table 9*Participant interview sentiment codes*

Sentiment	Marilyn		Shirley		Kanzeegitimido		Totals	
	Absolute	Column- relative	Absolute	Column- Relative	Absolute	Column- Relative	Absolute	Column- relative
Negative	0	0.00%	7	25.93%	8	42.11%	15	17.44%
Neutral	20	50.00%	7	25.93%	4	21.05%	31	36.05%
Positive	20	50.00%	13	48.15%	7	36.84%	40	46.51%

Coding for sentiment allowed for a more in-depth exploration of how Elders feel about particular aspects of incorporating technology in the revival process. An expanded table is included in Appendix H. This data revealed higher percentages of positive sentiment regarding the implementation of technology in the language revival process for all participants.

Although I did not explicitly ask to what extent Elders thought culture was accurately imparted in digital technologies, the responses implicitly conveyed their thoughts on culture in digital technologies. By offering an opportunity to discuss through the semi-structured interview format freely, Elders' perceptions regarding how culture was accurately conveyed were revealed. Further discussion of these findings is outlined in Chapter 5, Section 5.3

4.3 Participant Review

Participants were given copies of their transcript to support the accuracy and transparency of the data, thus increasing the validity of the research. Each participant reviewed their transcripts to provide further input, clarification, or omit portions of their transcripts from the interview process. None of the participants made any changes to the transcripts provided.

4.4 Online Language Programming

A review of two asynchronous Anishinaabemowin language courses was conducted. Courses were chosen based on availability and accessibility, as noted in Section 3.2.2.2. The observational grids for each course, which are presented in Table 10 and Table 11, were used to assess each online course based on the optimal pedagogical strategies discussed in Section 3.2.2.2. I reviewed themes emerging from an analysis of the courses for possible alignment with themes emerging from Elder transcriptions.

As noted in Section 3.2.2.2, I viewed only partial sections of each course to supplement the data collected from Elder interviews and gather a perspective on how others use digital

technologies to revive their ancestral languages. Viewing the beginning portions of the courses allowed me to experience language learning in an asynchronous environment similar to that of a new learner.

4.4.1 Anishinaabemowin asynchronous course #1.

The *Let's start Ojibwe* language series presents the majority of learning material via video (Figure 1a & 1b). Supplementary materials (i.e. worksheets, readings, and email correspondence) were not part of the free course. For a fee, students could access the supplementary material, professor feedback and complete a certificate program. For my research, I focused only on the video series freely available online. I viewed 5 of the 29 videos of the *Introduction to Anishinaabemowin* course (total watched time: 28 minutes and 45 seconds). Each video viewed was three to seven minutes in length and viewed in full. Data collected from asynchronous classroom field notes were placed on a five-point Likert scale and compared with the coded material from the Elder interviews.

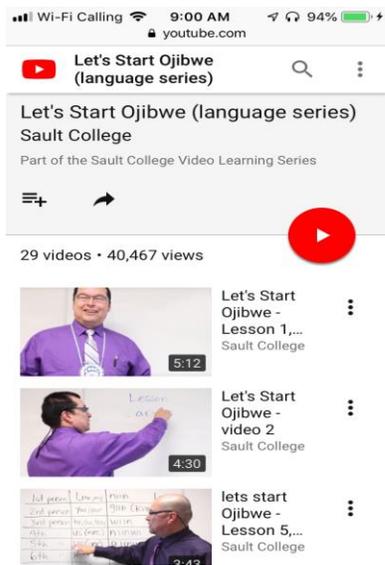


Figure 1a: Anishinaabemowin online asynchronous course videos available from [Sault College (2014, June 7). *Let's start Ojibwe* [Video file]. Retrieved from <https://www.youtube.com/playlist?list=PL7XVz2qhjMdGe7COzL5HdwSaa06JZIZjN>]

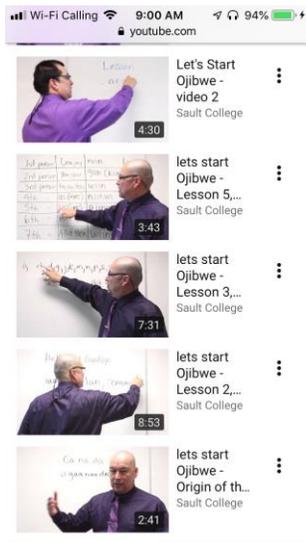


Figure 1b: Anishinaabemowin online asynchronous course videos available from [Sault College (2014, June 7). *Let's start Ojibwe* [Video file]. Retrieved from <https://www.youtube.com/playlist?list=PL7XVz2qhjMdGe7COzL5HdwSaa06JZIZjN>]

Let's start Ojibwe is an introductory course that included a brief historical background and context for the language with explanations in Anishinaabemowin and English. The observational notes taken during each video are presented in Table 10.

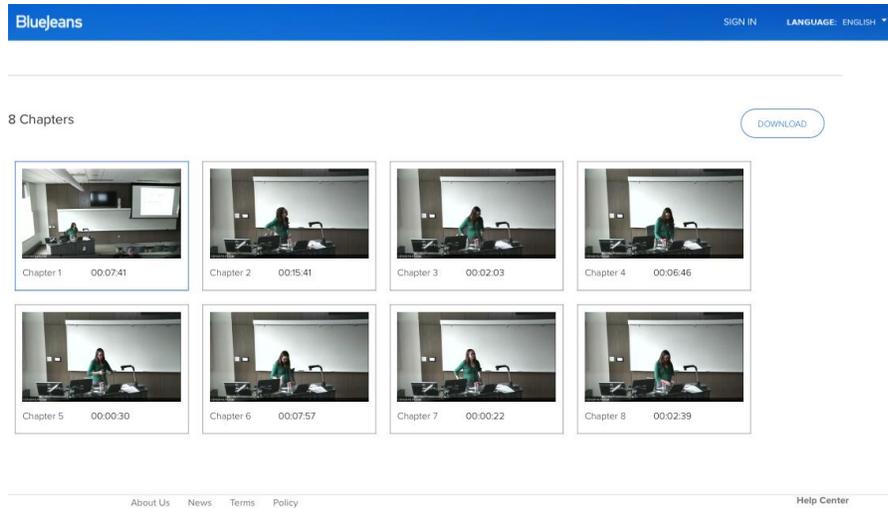
Table 10*Observation of Asynchronous Course Strategies*

Course Content	Pedagogy
<ul style="list-style-type: none"> ● Each of the videos (as described in Section 3.5.1) focuses on a specific language skill including the pronunciation for specific verbs, nouns, plurals, as well as simple interactions, including greetings and parting phrase ● Feelings, tenses, personal pronouns, colours, and numbers are also covered in the course. 	<ul style="list-style-type: none"> ● Of the 28 minutes and 45 seconds of video viewed, 2 minutes and 59 seconds were in Anishinaabemowin (including sounds, single words, and small phrases). The instructor spoke Anishinaabemowin approximately 10% of the time, with the remaining 90% of spoken language being in English. ● Each section or course module includes a quiz with a culminating two-part online examination. ● The focus of the course is on listening, reading, and writing. Student-created soundbites for oral practice and assessment are required. ● Learners record themselves responding to specific questions in Anishinaabemowin, then upload audio or video clips for assessment.

The introductory course to *Anishinaabemowin* focuses on the written and spoken word. While, it may seem curious that the majority of the language spoken in the videos was English (approximately 90% of the time) this was an introductory course requiring the instructor to set a foundation for the language as students would have minimal experience with *Anishinaabemowin*. Explanations, historical overviews, and clarifications in the English language could account for the lower percentage of *Anishinaabemowin* in the videos. Table 10 is discussed in further detail in Chapter 5, Section 5.4.

4.4.2 Anishinaabemowin asynchronous course #2.

The Online Ojibwe Language Program offers beginner to intermediate Ojibwe (Anishinaabemowin) with four course options, each comprising seven to fifteen lessons, freely available online (Figure 2). Each of the asynchronous lessons includes songs, video recordings, and use of English and Anishinaabemowin with actions to support learners, as well as written works and access to the online archives. The videos consist of a recorded Anishinaabemowin class posted on the University of Wisconsin Eau Claire website, allowing asynchronous public access to *Anishinaabemowin* language classes. I reviewed 27 minutes and 17 seconds of two of the 32 introductory videos from the Beginning Ojibwe 1 Archive section.



*Figure 2: Anishinaabemowin online asynchronous course videos available from [Geniusz Makoons, W. (2018). *Beginning Ojibwe 1 archive* [Video file]. Retrieved from <https://www.uwec.edu/academics/college-arts-sciences/departments-programs/languages/academic-offerings/all-languages/online-ojibwe-language-program/>]*

The video shows the teacher and students interacting in a classroom setting. The course was live recorded and posted for asynchronous viewing. Table 11 presents observations based on the course strategies evident in the videos.

Table 11*Observation of Asynchronous Course Strategies*

Course Content	Pedagogy
<ul style="list-style-type: none"> ● Prayers, greetings, introductions (self and others) are presented in the target language (<i>Anishinaabemowin</i>) ● Explanation of the structure of the language is given in English ● Supplemental materials are freely available through hyperlinks on the class website 	<ul style="list-style-type: none"> ● Of the 27 minutes and 17 seconds of video viewed, 4 minutes and 2 seconds of the language are presented in <i>Anishinaabemowin</i>. The instructor speaks <i>Anishinaabemowin</i> for approximately 16% of the time. ● Instructions and explanations are given in English ● Song was included as a teaching strategy ● Repetition of the skill being taught is encouraged

The course offers free pedagogical materials on its website to support student learning. As an introductory course, many of the explanations and clarifications are given in English. Approximately 84% of the language spoken is in English, with approximately 16% spoken in *Anishinaabemowin*. Although English is spoken less than in the Sault College course, the amount of English spoken is still considerably higher than the amount of *Anishinaabemowin*. As with the other course, this course is an introductory course, setting the foundations for language learning in an asynchronous environment. It is not surprising that the majority of the explanations are in

English, while traditional prayer, song, and poem (as a pedagogical teaching strategy) are offered in *Anishinaabemowin*. A detailed discussion of this course is outlined in Chapter 5, Section 5.4.

4.4.3 Comparison of online language courses.

Each of the language courses uses digital tools to relay the Anishinaabemowin language to learners worldwide. Based on the optimal pedagogical strategies (Section 3.2.2.2), a five-point Likert scale with one representing *never* and five representing *consistently observed* was used to assess the pedagogical strategies in each of the introductory courses (Table 12).

Table 12

Observational Grid Asynchronous Online Course Comparison

Pedagogical Strategy	Course 1 Sault College	Course 2 University of Wisconsin
Making opportunities for the learner to talk	2	4
Expecting the learner to talk or respond (Wait Time)	2	4
Asking questions to confirm understanding	1	3
Speaking in the target language – teacher and student	1	3
Focus on verbs	3	3
Interaction in online discussions	2	3
Reflection of learning	3	4
Intentional small and large group design	1	2

The course offered by the University of Wisconsin Eau Claire was a recorded live class. I observed the recorded interactions of the students (in-class and online) and the teacher. The observational grid, which reflects the asynchronous course data, reveals similarities and gaps between the teaching strategies in the asynchronous online course and the pedagogical strategies discussed by Niess & Gillow-Wiles (2013; 2018).

As stressed by Niess & Gillow-Wiles (2013; 2018) and noted by all three participants, learning a language in an immersion-like setting is essential for students acquiring a language. As a researcher, I was looking for best pedagogical practices in the introductory courses. Since both courses were targeted at beginners, I anticipated that most of the preliminary content would be presented in English. By the third class, I was looking for a more immersive experience (video) with more speaking in the target language and less in the English language. The University of Wisconsin Eau Claire progressed quickly to a higher ratio of *Anishinaabemowin* to English after the first introductory class. Students were encouraged to use the words they had learned, make mistakes, ask questions, and take part in daily songs, chants, and prayers. This course encouraged ‘*repeat after me*’ strategies and used a significant amount of repetition to engage the learner with the material.

The instructor in the Sault College asynchronous course spoke and taught using a higher ratio of English to *Anishinaabemowin* in the videos I viewed. I anticipated ‘repeat after me’ phrases with wait time for asynchronous learners. Although this was implied, the instructor only once encouraged the asynchronous student to follow along but, in the videos that I viewed, did not explicitly state phrases such as “you try,” “repeat after me,” or “try again.” Creating opportunities for students to speak meaningfully, using the strategies mentioned above, can be

developed through intentional small and large group design, a key component of the language learning process. Large group design was the focus of both courses, reaching a significant number of students at one time.

Niess and Gillow-Wiles (2013; 2018) discussed creating opportunities for speaking not only through small and larger group design but by teaching verbs in the foundational lessons. The focus on verbs was evident in the Sault College course. An introductory lesson on the verb 'go' with the past tense 'went,' as well as later lessons discussing 'fish' and 'hunt,' allowed learners to put together phrases to interact with others. The University of Wisconsin Eau Claire course focused more on daily interactions, song, chant, and prayer, as well as common phrases to interact with others.

Besides the previously mentioned strategies, reflecting on learning to enhance a skill is essential. Learners were encouraged in both courses to reflect on their learning through journal entries discussed in the viewed videos and marked by a teacher as a part of the fee-based version of the course (not offered for the freely available video courses). Both instructors in each course also encouraged students to identify areas of strength and areas in need of growth.

This chapter presented findings from Elder interviews and two online language courses. In good faith and to ensure transparency, I asked all Elders to review their interview transcripts. I offered them the opportunity to expand upon, edit or delete commentary; all participants chose to keep their original transcription. Two of the participants were inclined to support the implementation of technology in language revival initiatives, while the third had reservations about the use of technology and the ability to meet the cultural and spiritual practices embedded within language learning.

In terms of pedagogical practices in asynchronous courses, field note observations revealed educators speaking in both the colonial language and the target language. Immersive environments (speaking only in the target language), which are suggested to be best practices when acquiring a language (Niess & Gillow-Wiles, 2013; 2018), were not observed in the asynchronous learning environment. Chapter 5 elaborates upon the findings and the potential implications of the findings in language revival initiatives.

Chapter 5

Discussion

5.1 Overview

The purpose of this research was to critically explore how Elders are currently leveraging digital technology to revive ancestral languages in their teaching practices. The following three questions drove the research:

How do Elders who use technology in their language teaching:

1. describe the benefits, drawbacks, and preferences of technology?
2. reveal the accuracy with which cultural knowledge is imparted through technology?
3. view the impact of technology on their role as traditional knowledge keepers and intergenerational language transmitters?

Data analysis uncovered alignments between the views of Marilyn and Shirley. However, Kanzeegitimido's views were not aligned with Marilyn and Shirley. Additional analyses uncovered unexpected results regarding the sentiments in leveraging technologies for language revival. These results are discussed in Sections 5.2, 5.3, and 5.4.

5.2 Discussion of Findings

In a 2018 study, Kaleimamoowahinekapu Galla suggests that “the use of digital technologies in Indigenous communities is perceived as a double-edged sword.” She continues to explain that the practice is “met with mixed emotions of suspicion, skepticism, but also hope—raising questions about its benefits and drawbacks” (p.104).

Kaleimamoowahinekapu Galla's statement represents my journey in exploring how Elders view digital technologies in the language revival process. Each Elder I spoke with brought individual ideas, thoughts, critiques, and emotions to the interview. Like

Kaleimamoowahinekapu Galla, I also discovered that digital technologies are a “double-edged sword.” Technologies could be used as a tool for breathing life back into an endangered or dormant language, while simultaneously demonstrating the inequalities and social injustices associated with accessing those technologies.

I was given the opportunity by three gracious Elders to tell their stories and experiences with digital technologies and their work in reviving their ancestral languages. I strove to present their stories accurately and with integrity. I recognize that there are other ways to have conducted this research, including quantitative methods, but I felt strongly that my chosen methods aligned most closely with Indigenous methodologies, and ensured that the focus of the data collection and analysis was on the words of my three participants: Marilyn, Shirley, and Kanzeegitimido.

As Delgado (2003) claimed, digital technologies that are used to document, archive, and teach language have contributed to privacy concerns, cultural appropriation, and the manipulation of cultural knowledge. I recognize through this research process, similar to the thoughts of Kaleimamoowahinekapu Galla (2016), that digital technology is an enabler of language revival as well as a complication, particularly when addressing how cultural and spiritual knowledge is disseminated when using technology.

As a second language elementary teacher, I have anecdotally noted that teacher comfort with technology and willingness to take risks in implementing technology impacts the extent to which it is used in the classroom. These anecdotal mental notes formed the basis for my initial interest in Elder comfort levels with using technology and how this might influence knowledge dissemination and language revival. Marilyn noted that the less comfortable an Elder is with using technology, the less likely they are to use digital tools to connect with the younger generation to share knowledge in that way. However, as Shirley claimed, Elders can build a

technological relationship with the younger generation by learning how to use technology with their grandchildren, nieces, or nephews. This may create favourable conditions for increasing comfort in using technology and, therefore, a willingness to explore the value of using technology in their language teaching.

Shirley explained that:

Some of the Elders don't know how to type or don't use the media [...] I always tell them to ask their granddaughters or grandsons to help them look for other materials that are out there because when I started teaching there was no language materials, but there is quite a bit now on websites and that for them to look for if they want to (personal communication, March 8, 2019).

Shirley speculated that some Elders might choose not to include digital technology in their teaching practices, whether or not they possess the skills to do so. This may indicate continued (philosophical) resistance and may, in part, be because of personal preferences regarding traditional teachings without the use of digital technologies. Resistance (technophobia) is something that Kanzeegitimido alluded to in her interview. She discussed the importance of face-to-face learning in the transmission of traditional, spiritual, and cultural knowledge. She suggested that Elder resistance to using technology for language transmission stems from a power struggle between Elders and youth. Youth using technology (i.e. internet search engines) to contest the teachings of Elders results in the internet becoming a tool of dominance to override traditional teachings, thereby bypassing the role of the Elder in language and knowledge dissemination. She also maintains that when youth attempt to access traditional teachings through digital means, they miss critical pieces traditionally taught by Elders through relational approaches.

Kanzeegitimido's belief that the role of the Elder is changing with the implementation of technology is in contrast with Marilyn, who stated: "I don't see how it [the role of the Elder] would change."

Marilyn noted that:

As younger generations become language teachers, this is expected to shift from resistance in using online methods and digital pedagogies in teaching towards a generation of language teachers that embrace and use technology in everyday teaching practices (personal communication, February 1, 2019).

Perhaps this is why Marilyn claims that the role of the Elder will not change with the implementation of technology. She regards the role of technology from the perspective that, as younger generations move forward in their language learning journeys, they bring their technological skills and the ability to include technology as a part of their teaching practices when they become Elders. In contrast, Kanzeegitimido views technology in language learning from a medicine and relational perspective, as noted in Section 4.2.3.

Shirley built upon Kanzeegitimido's argument about the importance of personal presence and relationships in the language learning process. In her interview, Shirley advocated for building relationships with youth and including students in identifying content to be included in the language program, noting that asking them what they want to learn (content) aids in student engagement. Throughout this section of Shirley's interview, I noted that she alluded to the continued colonial undertones in the classroom. Colonial teaching practices continue to be present and persistent in modern FNMI language learning classrooms in part due to parameters set by the Ministry of Education, which are implemented by schoolteachers in a traditional European classroom setting. These parameters, curriculum expectations, learning goals and

success criteria set by a colonial institution (i.e., the Ministry of Education) impact the learning of FNMI students, such as how they interact with learning their ancestral language. Including youth in developing the curriculum content encourages engagement with the language as Shirley discussed and, as Kanzeegitimido noted, this could empower youth, giving them an opportunity to engage in sacred medicine practices as a part of their ancestral community (clan).

Community and *communities* were both terms that appeared in Marilyn and Kanzeegitimido's interviews. When clustering terms in the word frequency count, I included *family*, *place*, *home*, and *together* as these words appeared in the context of community. This cluster was the largest word frequency count cluster across participants and accounted for 15.60% of the total words used in all participant interviews. Although it was anticipated that the word frequency count would demonstrate significant results, it did not. However, it appears that all three participants indicated *community* as an essential component in language revival. For example, both Shirley and Kanzeegitimido discussed the importance of connecting with Elders, family, and friends, who are all a part of the broader community. Shirley spoke of connecting youth with others who speak their ancestral language as well as collaborating with Elders and Anishinaabemowin speakers. Each of the individuals described in Shirley's interview are a part of the broader language learning community, so despite not using the term(s) *community(ies)*, it can be argued that the importance of *community(ies)* is implied in her intended meaning. The importance of community in learning to speak an ancestral language is also addressed in the *Anishinaabemowin* asynchronous course. In the first course observed (Sault College), the instructor encourages students to connect with speakers in their community to practice their language skills. It was suggested that this would build their fluency and comfort level and allow them to use what they have learned in an authentic context.

It is interesting to note that Marilyn discussed building an online community of learners at the post-secondary level by using specific conferencing software. However, neither of the courses nor the other participants mentioned building an online community of learners or alluded to how this may be accomplished. Additionally, in the Sault College course, the instructor did not directly address students (i.e., by using phrases such as “you try” or “repeat after me” or making continued eye contact), potentially putting asynchronous students at risk of disengagement, particularly if the course is lecture style. Kanzeegitimido was concerned about this issue when she spoke about the importance of relational interaction and spirituality in language learning. She argued that this is not evident in digital language learning.

The themes of language as a reciprocal process, and the importance of communities, and how they help each other revive their language, culture, and spiritual practices through knowledge dissemination, were present in all interviews. A review of the transcripts and the cluster word frequency count for Marilyn, Shirley, and Kanzeegitimido reveal a focus on sharing (4.96% of the total word count) and how sharing is [not] yet implemented in the digital sphere. There is a concern for “polluting the medicine ways,” as Kanzeegitimido presented, and a disconnect from relationality. However, Shirley and Marilyn discussed *experience*, *authentic learning opportunities*, and *land-based education* (8.51% of the total word frequency count) in the language learning process. It seems that shared experiences through authentic learning opportunities (learning that is tied to the land) have an important role in the revival of ancestral languages and should be considered when developing digital language programming and implementing technology in the language learning process. Perhaps a hybrid course such as the one being developed in the Faculty of Education at Ontario Tech University could combine experiential learning with technology-enhanced learning in a way that allows for maximum

benefits for students. In the course, as mentioned above, students would complete part of their coursework online in a virtual classroom, and part on the land with an instructor in their geographical context.

Connecting culture to language learning is also present in all three participant interviews. *Tradition, traditional knowledge, sacred, and medicine* were clustered in the word frequency count and accounted for 6.03% of the total words used across all participant interviews. In the asynchronous online course offered by the University of Wisconsin Eau Claire, the instructor discusses the importance of tobacco and the tobacco offering. The prerecorded Livestream class took a break to take part in a prayer and tobacco offering outdoors. This cultural practice embedded in the prayer and language learning may not be as meaningful for the student taking part asynchronously in the class.

To implement technology in authentic and experiential learning, reliable access to Wi-Fi is a necessity. I would argue that the geographical location creates barriers to the implementation of technology in some communities. Marilyn stated in her interview that access to reliable Wi-Fi remains a problem in her community, whereas Shirley and Kanzeegitimido did not mention this concern, but alluded to the portability of technology as a benefit when implementing it into experiential language learning. It is possible that because Shirley and Kanzeegitimido are located in Southern Ontario, access to reliable Wi-Fi is more readily available, whereas Marilyn, who is located in rural Western Canada, noted that Wi-Fi accessibility varies from area to area. The barrier caused by unreliable access to Wi-Fi, as described by Marilyn, impacts student access to online language learning tools, programs, and digital language communities. Challenges in accessing Wi-Fi also impact the ability of language teachers to integrate technological devices into their language instruction. Inequitable and unreliable access underscores that digital

technology is not equally available to everyone. Marilyn also noted that additional barriers to language revival include the lack of funding and technicians to troubleshoot technological problems. Kanzeegitimido noted that the cost of classes to individual students could be a barrier to accessing language programming. However, she did not mention the lack of funding to implement programs in the same manner as Marilyn. Shirley did not mention funding as a barrier to online language programming.

5.3 Interview Sentiment

The interview transcripts provided a rich terminology and thematic dataset for analysis. I further examined the dataset by choosing to code for sentiment to uncover positive, neutral or negative connotations in each participant's transcript. These sentiments were specifically explored to discover attitudes towards digital technologies in reviving ancestral languages. What I discovered was that, when analyzed, Marilyn's transcript contained no negative sentiments. This was a surprising result given the urgency to protect languages facing extinction. I reviewed the transcript and discovered that, when discussing a negative sentiment, it was immediately followed by a [potential] solution, rendering the sentiment neutral. It appears that Marilyn's transcript was solution-focused when identifying potential problematic situations.

Kanzeegitimido's interview uncovered 42.11% negative sentiment compared to those of Shirley (25.93%) and Marilyn (0.00%). I identified that, when discussing the interconnectedness of culture and language, Kanzeegitimido discussed technology in a more negative (42.11%) or neutral (21.05%) context. Many of the negative sentiments came from her discussions with other Elders and their sentiment about technology's role in language revival. As a result, I suspect the negative sentiment is not solely reflective of Kanzeegitimido's views as, in her interview, she

incorporated the views of others alongside her own. Shirley also mentioned the thoughts of other Elders in her interview. It appears that the inclusion of others' views, that is, the views of other Elders, may have led to a higher negative sentiment than that of Marilyn.

In terms of positive sentiment, Kanzeegitimido's interview revealed a 36.84% positive sentiment compared to 48.15% positive sentiment in Shirley's interview and 50.00% in Marilyn's interview. It appears that positive sentiment regarding leveraging technology to revive ancestral languages outweighs the negative sentiment in each of the interviewee transcripts.

All three participants remarked that technology is a tool and is not intended as a replacement for good pedagogical practices. Shirley and Marilyn expressed optimism when discussing the future of technology in language revival initiatives. This contrasts with Kanzeegitimido's concern about the dangers of relying on technology as the sole means of transmitting linguistic and cultural knowledge. Each of the participants' expressions in this regard led me to coin a concept, *guarded optimism*, a term which I define as *the acknowledgement of the benefits when leveraging technology [digital tools] in language revival initiatives while being aware of technology's potential negative impacts on relationality [culture, spirituality, and medicine practices]*. Situating the concept, *guarded optimism*, on a scale from Technophobia – Technophilia is an important piece to the revival process. *Guarded optimism* is closer to the Technophilia end of the scale, as illustrated in Figure 3.

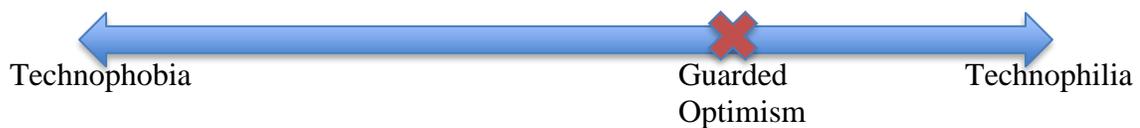


Figure 3: Technophobia to Technophilia Scale

I recognize that the concept, *guarded optimism*, is not unique, but that it is part of a larger framework and is situated within a broader educational context. For example, Mishra and Koehler (2006) address resistance to the use of technology in an educational context through the TPACK framework (technological knowledge [TK], pedagogical knowledge [PK], and content knowledge [CK]).

5.4 Asynchronous Online Courses

Observation took place in two asynchronous online courses, as noted in Section 4.4, intending to compare/contrast the instructors' pedagogical practices with those outlined by Niess & Gillow-Wiles (2013; 2018) and as described in Elder interviews. I noted that the pedagogical practices in the asynchronous courses aligned in some respects with the best practices discussed by Niess & Gillow-Wiles (2013; 2018) and the transcripts of Elders. As Shirley discussed, students and teachers must speak the target language at all times in addition to communicating in the written word. However, this practice was not observed in the online asynchronous Sault College classes, with a low ratio of the target language to English noted in Section 4.4.1. The University of Wisconsin Eau Claire course offered more opportunities to speak, listen and respond to the instructor in the target language, as noted in Section 4.4.2, but still had a very low target language to English ratio. However, both courses were offered at the introductory level and thus, to aid student understanding, English was the primary language of instruction. It may

seem counterproductive to speak more in the colonial language than in the target language, however, a clear understanding of how the language works is essential because, in asynchronous environments, students cannot ask questions or ask for clarification as they could in a face-to-face environment.

Providing learners with the opportunity to speak in the target language, and creating a space for interactions in online discussions, was a pedagogical practice of importance discussed in Elder interviews and research by Niess and Gillow-Wiles (2013). However, the review of the Sault College asynchronous class uncovered limited opportunities for discussion and reciprocity in the language learning digital classroom. As I viewed the Livestream University of Wisconsin Eau Claire course, I noted student-teacher interactions in the target language and the relational reciprocity involved in language learning. As Marilyn mentioned in her interview, and as Niess and Gillow-Wiles (2013; 2018) discuss, creating a community of learners in the digital space is crucial to knowledge dissemination in the online environment. Based on the observations made in each of the asynchronous courses, the instructors did not establish a digital community of learners. Asynchronously viewing the language videos did not /does not allow learners who digitally access(ed) the courses to interact with each other, thereby making it impossible to create a digital community of learners. It is to be noted that the second course at the University of Wisconsin Eau Claire offers a Livestream of their courses at specific times when students could engage with the class and teacher. I observed a community of learners when viewing the recorded in-class sessions. However, as mentioned in Section 4.4, there is potential for disengagement in the Sault College course as the instructor did not directly address students (i.e., by using phrases such as “you try” and “repeat”) or engage them in the reciprocal learning process. A learning management system (LMS) that allows for interactive discussions and

messaging did not appear to be included as part of this course, although it is possible that further along in the course (beyond the introductory classes that I observed), an LMS may have been introduced.

Livestream classes and asynchronous online learning both present benefits and drawbacks. Although beneficial, asynchronous ancestral language learning excludes by its very nature some components of the learning process, including culture, immediate feedback, and as Kanzeegitimido mentions, the spirituality embedded in learning an ancestral language. While I observed prayer, song, and discussion of cultural ceremonies in the course offered by the University of Wisconsin Eau Claire, I found a disconnect between what was being presented (spirituality, ceremony, and culture) and sitting in my living room viewing the videos. The physical space I was in was not conducive to experiencing the spirituality that the instructor attempted to convey. Presenting culture in the digital space did not allow for the smell (i.e., smudging), feeling, touch, and physical interaction embedded in the cultural teachings of the language. The disconnect in learning the language through digital means and conveying the value of relational and physical presence when learning ceremony through language and language through ceremony was concerning to Kanzeegitimido.

Both Kanzeegitimido and Shirley emphasized authentic learning experiences and how these experiences offer opportunities to speak meaningfully in the target language. This was not viewed in the asynchronous courses. Shirley compared the learning of students in two of her courses, a face-to-face on-the-land course, and a digital online course. She noted that the students in the face-to-face environment progress more quickly than those in the digital space and hypothesized that this is due to more meaningful and authentic learning experiences. Perhaps due to the nature of asynchronous classes and the need for relationality, introductory courses are best

offered in face-to-face environments to set the foundation and parameters for learning ancestral languages and then later supplemented with asynchronous learning.

This chapter discussed the findings presented in Chapter 5 and provided a comparison between the interviews of Marilyn, Shirley, and Kanzeegitimido and the two asynchronous *Anishinaabemowin* courses. It appears that there is an overall positive outlook when implementing technology in the language revival process. This is not without some hesitation, a concept I present as *guarded optimism*, situated in the broader educational TPACK framework. It appears that, when leveraging technology in the development of language revival programs, the greatest concerns are accurately representing the culture, honouring the role of Elders, and how to include spiritual and ceremonial practices. Chapter 6 provides a synopsis of my research as well as limitations and future research possibilities.

Chapter 6

Conclusion

If culture, identity, and language are intertwined as Bruner, (1990), Fishman (1991 & 1994), and Wittgenstein (1961) argue, and as Cutknife (2018) and Kanzeegitimido purported in their conversations with me, then collaboration with FNMI Elders is required to create spaces where technology can be leveraged to revive ancestral languages in authentic ways.

Kaleimamoowahinekapu Galla (2016) argues that digital technologies are the foundation for discussion when educators are seeking to implement (new) technology in Indigenous language education. She further explains that cultural integrity must be maintained when leveraging digital language tools.

To my knowledge, this research is one of the first studies to specifically speak with Elders to gain their input regarding the use of digital technology in the language revival process. Continued investigation with Elders from varying language groups and geographical locations can provide a broader scope of what works well and what needs to be addressed. Moving forward using this data, digital language teachers and digital program developers can embed culture and cultural nuances in collaboration with Elders in their language programs. This will honour the traditional role of the Elder in knowledge dissemination and intergenerational language transmission.

This research aimed to address how Elders are currently leveraging digital technology to revive ancestral languages in their teaching practices. My study presented the perspectives of three Indigenous Elders, driven by the following three questions:

How do Elders who use technology in their language teaching:

1. describe the benefits, drawbacks, and preferences of technology?

2. reveal the accuracy with which cultural knowledge is imparted through technology.
3. view the impact of technology on their role as traditional knowledge keepers and intergenerational language transmitters?

Data analysis indicated that Elders generally agree that there is a space for technology in the language revival process, but that it [technology] cannot replace good pedagogical language teaching practices. Elders also agreed that community involvement is essential as a component when reviving ancestral languages. Conversely, there is a considerable difference in opinion on the transmission of culture and spiritual knowledge when using technology in the revival process. The opinions of Elders also differed on whether the role of the Elder changes with the implementation of technology in language revival and how it may change.

In Section 5.3, I presented the concept, *guarded optimism: the acknowledgement of the benefits when leveraging technology [digital tools] in language revival initiatives while being aware of technology's potential negative impacts on relationality [culture, spirituality, and medicine practices]*. This concept describes the feeling presented by Elders when asked about the incorporation of technology in the language revival process situated in a broader educational framework (TPACK, Mishra & Koehler, 2006). Sections 6.1 and 6.2 discuss limitations and future research.

6.1 Limitations

I recognize that this study is not without its limitations. I bring my own biases and colonial perceptions, which affect my perceptions and the research process. Using the guiding principles of Smith (2012) and Wilson (2008) as presented in Section 3.1, I hope to have minimized bias in my research.

By its very nature, technology presents its own limitations in the research process. The interviews in my research were conducted by phone, Adobe Connect, and Facebook Messenger. These methods of interviewing presented limitations, including the inability to read facial cues or body language to build rapport and engagement during the messenger and telephone interviews as well as potential missed opportunities to expand upon a specific element of a response.

The scope of this research is limited by the small sample size and lack of diverse language families as all participants spoke a language from the Algonquian language family. A larger sample size, coupled with a longitudinal research process, may provide deeper insights into Elder perspectives and the use of technology in language learning initiatives.

I completed the interview with Kanzeegitimido through online textual communication via Facebook messenger. Despite the ease of communication, there are limitations to relying solely on this type of questioning in the interview process. As the conversation was asynchronous, body language and social cues are lost in textual communication. Although I included follow-up questions in Facebook messenger, opportunities to hear and respond to intonations that are a part of conversation could limit the personal rapport that is created when speaking face to face. Similarly, the telephone interview with Shirley was not face to face, which could limit the social cues that are a part of a face-to-face interview. Each of these interviews (Shirley and Kanzeegitimido) has aspects that could influence the quality and type of information that is shared during the interview process.

A potential missed opportunity during the interview process with Marilyn arose when I spoke with her about the changing roles of Elders. I asked her how she saw the role of the Elder changing with the implementation of technology in language teaching. Marilyn indicated that she did not see how the role of Elders would be impacted by the use of technology in language

teaching and learning. Perhaps the statement indicates that the role of the Elder is just that: an Elder is an Elder regardless of the integration of technology into their teaching or learning practices. It may indicate that she does not envision a change in the role of the Elder, as Elders were always language teachers and will remain as language teachers, the intergenerational transmitters of knowledge. Upon reflection, I would like to have explored this thought further to gain a deeper understanding of why Marilyn feels the role of the Elder will not change.

In retrospect, there are areas of the semi-structured interview that I would have liked to explore further by posing follow-up questions to gather a more in-depth understanding. However, given that I am a new researcher, I do not yet possess the interviewing skills of a seasoned interviewer. Future research using an interview data collection method will begin to build my repertoire of skills in the interview process.

Although I did not explicitly ask the Elders to what extent they perceive that culture is accurately imparted in digital technologies, their responses implicitly conveyed their thoughts on culture in digital technologies. By offering an opportunity to discuss freely through semi-structured interviews, Elders' perceptions of culture were revealed in the process. Had this content not emerged from our semi-structured interview, I would have used probing questions to elicit responses. In hindsight, building in interview questions specifically addressing culture in digital technologies may have evoked different responses.

Research indicates that there are benefits in small sample sizes when gathering in-depth information in semi-structured interviews (Battiste, 2002; Kovach, 2012; Smith, 1999; Wilson, 2008). However, speaking with more Elders and individuals who are leveraging technology to teach their ancestral language can provide further detail into how different Indigenous language communities are approaching the challenges and describing their successes. The three

participants who were interviewed in this research had differing opinions, ideas, beliefs, and practices in their language teaching and learning. A larger sample size might reveal a greater diversity of perspectives than are represented in my study.

The ancestral languages spoken by participants in this study come from the Algonquian language family. Using the EGIDS scale (Eberhard, Simons & Fennig, 2019), both *Anishinaabemowin* and *Nêhiyawêwin (Cree)* appear to be situated in the level 6 (threatened) to level 7 (shifting) revival stage based on the number of fluent speakers. Both *Anishinaabemowin* and *Nêhiyawêwin (Cree)* languages appear to be more advanced in their revival process compared to languages such as Potawatomi and Seneca listed at level 9 (dormant), or Dakota and Haida appear to be listed at level 10 (extinct) (Eberhard, Simons & Fennig, 2019). Teachers of languages most at risk could benefit from knowing what has worked well and what has not, given the urgency in facilitating language revival.

6.2 Future Research

The impact on the role of the Elder with the development and implementation of technology in language programming is an area that could be further researched to identify critical elements of current resistance to including technology in ancestral language teaching practices in a variety of ancestral language groups.

Future research in this area could consider the colonial aspects that infiltrate our digital pedagogy. Battiste (2002) discusses how decolonizing education is not just for Indigenous education; it is beneficial to all students. Research is needed to address how we can decolonize the ancestral language learning process for all students while leveraging digital technologies and ensuring the inclusion of Elders. This process will require further exploration and involvement

from Elders, communities, governments, and citizens to ensure that learning is authentic and includes the dissemination of cultural and spiritual knowledge.

Future research looking at a global approach and how Indigenous languages worldwide are holding their ancestral language within a body of English can aid others in their revival initiatives. Creating opportunities for collaborative global research to revive languages most at risk, according to the EGIDS, can offer a space for learners and teachers to share effective practices in their language revival process.

It would be beneficial to look at how developing nations are leveraging technology differently than developed nations in their language revival initiatives. As an example, research comparing the differences in technology use by Elders in developing and developed nations may lead to an improved framework, best practices, or pedagogical strategies. Addressing what Indigenous language groups are doing globally to revive their languages can be further explored through studies looking at how Indigenous language teachers support each other through communities of practice to integrate technology in their teaching. One worthy initiative in this area is the Ethnos Project (<https://www.ethnosproject.org/>), which seeks to share news of global language revival projects.

Considering this study from a different perspective may provide further insight into how the revival process can be facilitated through the use of technology. Conducting research concerning technology resistance in Indigenous language revival within a TPACK framework (Mishra & Koehler, 2006) may provide a different perspective into the language revival process.

Future research may address how Elders use technology to revive their languages on the land. Shirley spoke about learning the language [Anishinaabemowin] on the land [outdoors], and it may be of interest to educators teaching in FNMI communities to develop strategies that

integrate traditional teachings on the land, language acquisition / revival, and technological devices.

It would also be beneficial to inquire about creating digital spaces that honour the role of the medicine ways, as described by Kanzeegitimido. Further research on a global level with Indigenous Elders may provide insight into how other communities are managing sacred spaces and places while using technology to impart cultural knowledge and language.

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Appendix A

Interview Questions

Open-ended questions presented in the form of a semi-structured interview were used to gather rich data from the participants. Below are the five consecutive interview questions posed to each participant.

“Before starting, I would like to remind you that at any point, should you feel uncomfortable or unable to continue with the interview, you may request the interview to end without any repercussions. You will still receive the honorarium for your time, and you may choose to include or exclude your previous responses in the study.

As we are conducting the interview online/by phone, it is important to note that we have taken every measure to protect your privacy. However, there is a minimal risk given the nature of digital technology. I would also like to remind you that this interview will be audio recorded. To protect your privacy, I would like to invite you to provide a pseudonym if you wish. In the thesis paper you will be identified by participant number 1,2,3, etc. or by your chosen pseudonym if you wish. How would you like me to address you during the interview? How would you like me to identify you in the research paper?”

1. Can you tell me a little about your knowledge and experience using technology and your ancestral language?
2. Tell me about the advantages you see in using technology in language revival?
3. Tell me what you see as disadvantages in using technology in language revival?
4. Do you anticipate any changes to the role of Elders or language keepers given the increase in technology use?

5. Is there anything else you wanted to add to what your community is doing in reviving languages, for example, engaging youth or children, using specific technology to support language acquisition?

Appendix B

Consent Forms

Title of Research Study: Elder Perspectives: Using Digital Technologies to Revitalize Indigenous Languages

You are invited to participate in a research study entitled Elder Perspectives: Using Digital Technologies to Revitalize Indigenous Languages. This study has been reviewed by the University of Ontario Institute of Technology Research Ethics Board [15013] and originally approved on [December 5, 2018].

Please read this consent form carefully, and feel free to ask the Researcher any questions that you might have about the study. If you have any questions about your rights as a participant in this study, please contact the Research Ethics Coordinator at 905 721 8668 ext. 3693 or researchethics@uoit.ca.

Researcher(s): Melissa Bishop

Principal Investigator, Faculty Supervisor, Students, etc.: Allyson Eamer

Departmental and institutional affiliation(s): Faculty of Education University of Ontario Institute of Technology

Contact number(s)/email: melissa.berry1@uoit.net

External Funder/Sponsor: n/a

Purpose and Procedure:

The purpose of this study is to uncover Elder perspectives surrounding the use of digital technologies in revitalizing Indigenous languages. Each participant will partake in a semi-structured interview process consisting of four questions related to the research question, “What benefits, drawbacks and preferences do Elders identify in using digital technologies to revitalize an at-risk Indigenous language?”

As the interviews are semi-structured, times for the interview may range from 30 minutes to 60 minutes, dependent on the individual participant. Should the participant require more than 60 minutes, time shall be granted to continue the interview no longer than 90 minutes in length.

The interviews will take place online via Adobe Connect or in-person as determined between the participant and the researcher. In-person interviews will take place at UOIT or in a community space in the individuals' community, to be decided between each individual participant and the researcher.

Classroom observations will take place in an asynchronous virtual Anishinaabemowin classroom. Observations based on Niess & Gillow-Wiles (2013) best pedagogical practices will be recorded using a five-point Likert scale (i.e. student interaction, speaking in the target language, and small/large group design).

Potential Benefits:

Benefits to the participant include having the opportunity to speak about the state of the Indigenous language used in their community and begin to create a partnership of understanding leading to respectful and responsive research practices in their communities.

Benefits to the Indigenous community include identifying areas of growth for Indigenous language revitalization projects, areas of strength, and potential for further discussion about how to effectively integrate digital tools into Indigenous language revitalization projects.

Benefits to society include identifying potential areas for growth in relation to the Federal Government's calls to action.

Potential Risk or Discomforts:

By partaking in this study, there are some associated risks or discomforts that may arise. Given the sensitive nature of Indigenous language heritage and current revitalization efforts, there is the possibility that participants may feel some emotional discomfort during the interview. To minimize these risks, participants will have the opportunity to speak with their cultural worker, spiritual advisor, or counsellor at any point during the interview process, after the interview process for debriefing, and will be offered referrals to services by their cultural advisor should they require further services beyond the scope of their cultural worker.

Storage of Data:

Data collected in this study including interview tapes, contact information, digital records, and survey data will be stored with this researcher, Melissa Bishop, and the research supervisor, Allyson Eamer, at the University of Ontario Institute of Technology Faculty of Education building at 11 Simcoe St. N. Oshawa, Ontario L1G 4R7. Digital data will be stored on a digital USB with encryption alongside any typed transcripts in a lockbox. This lockbox is only accessible by Melissa Bishop MA researcher, and Allyson Eamer Supervisor stored at the University of Ontario Institute of Technology Faculty of Education building at 11 Simcoe St. N. Oshawa, Ontario L1G 4R7. Upon study completion, when data is no longer required, the data will be destroyed to ensure the privacy of participants.

Confidentiality:

Information in this study collected through semi-structured interviews and virtual classroom observations includes participants' views and beliefs. The purpose is to identify how Elders perceive digital technologies in their language revitalization initiatives. This is an exploratory study seeking opinions, beliefs, and preferences in digital language learning tools. This researcher, Melissa Bishop, and supervisory officer, Allyson Eamer will have access to the information and data collected including identifying information about participants.

To safeguard the confidentiality and anonymity of participants, any identifying information, including names, places, births, institutions attended, and community agencies identified in the interview process, will be removed from the data.

Your privacy shall be respected. No information about your identity will be shared or published without your permission unless required by law. Confidentiality will be provided to the fullest extent possible by law, professional practice, and ethical codes of conduct. Please note that confidentiality cannot be guaranteed while data are in transit over the Internet.

Right to Withdraw:

Your participation is voluntary, and you can answer only those questions that you are comfortable with answering. The information that is shared will be held in strict confidence and discussed only with the research team.

If you withdraw from the research project at any time, any data or human biological materials that you have contributed will be removed from the study and you need not offer any reason for doing making this request.

You will be given information that is relevant to your decision to continue or withdraw from participation.

Removal from Study:

Participants will be removed from the study at their request. Participants may also be removed from the study should they not fit the requirements for participation, should the study prove detrimental to their mental health and well-being, or should they become ill.

Conflict of Interest:

There are no perceived conflicts of interest concerning this study.

Compensation:

Interview Participants will be given a \$10 honorarium for participation in the study in the form of a Tim Hortons Gift Card.

Debriefing and Dissemination of Results:

Participants will be informed of the completion and results of the study through their preferred method of contact indicated on the initial questionnaire. This will be verified with each individual participant upon completion of the interview to ensure each participant has access to the study. Results will be published in the form of an MA Thesis and Defense at the University of Ontario Institute of Technology. If participants are interested in learning of the results, they may also contact the researcher through email at melissa.berry1@uoit.net.

Participant Concerns and Reporting:

If you have any questions concerning the research study or experience any discomfort related to the study, please contact the researcher Melissa Bishop at melissa.berry1@uoit.net.

Any questions regarding your rights as a participant, complaints or adverse events may be addressed to Research Ethics Board through the Research Ethics Coordinator – researchethics@uoit.ca or 905.721.8668 x. 3693.

By consenting, you do not waive any rights to legal recourse in the event of research-related harm.

Consent to Participate:

Oral Consent

1. I have read the consent form to the participant. They have indicated that he/she understands the study being described.

2. The participant has had an opportunity to ask questions, and these questions have been answered. The participant is free to ask questions about the study in the future.

3. The participant freely consents to participate in the research study, understanding that he/she may discontinue participation at any time without penalty. A physical/digital Consent Form has been made available to him/her.

(Name or identifier of Participant)

(Date)

(Signature of Researcher)

Appendix C

Participant Interview Codes

Code	Comment
Ability to Implement Technology	Elders' capabilities in implementing technology in the language learning classroom.
Access to differentiated learning experiences	Using technology to differentiate teachings to meet student needs and enhance student learning experiences.
Accuracy of the dialect	How accurate or inaccurate the pronunciation or dialect of the teacher(s) in the online learning course(s).
Archiving	Archiving and storing language data digitally with the purpose of making the language data usable to communities.
Clarity of Digital Resources	The clarity of language resources available to students in the digital environment.
Comfort	Level of comfort of Elders/language teachers in incorporating technology into their language lessons.

Participant Interview Codes

Code	Comment
Connectivity	Reliable Wi-Fi connections are readily available (or not readily available) for learners.
Cost of individual courses	The cost of each individual course paid by each individual student.
Culture teachings not practiced in technological platforms	To what extent cultural teachings are not imparted through digital learning.
Digital Addiction	Dependence on digital technologies; individuals' compulsivity in using digital technology.
Digital Community	A community of learners and educators in a digital space. Online learning groups, online learning classrooms, a community of learners online.
Digital Technology Tools	Software tools such as online language courses, apps, digital games, podcasts, voice recordings, etc. are readily (or not readily) available to learners.
Disconnect from family and friends	Digital technologies are creating a rift or divide between family relationships.

Participant Interview Codes

Code	Comment
Disrespecting the past	Using technology disrespects the history embedded within the language and language transmission.
Elder Assisted Learning	The extent to which Elders assist in the language learning process through intergenerational transmission.
Elder Resistance to Utilizing Technology	Elders resisting using technology in their language revival programming.
Elder sense of threat	Elders feeling that their role is threatened by the inclusion or overdependence on technology to learn ancestral languages.
Elder Technological Comfort	Elders comfort levels using digital technology, hardware or software in the language learning environment.
Elder Technological Knowledge	Elders knowledge about available digital technologies, hardware and software that can be used in the language learning environment.
Face to Face Community	A group of students and/or educators engaged in a face-to-face language learning community.
Funding	The availability of funding to support language revival initiatives in communities/schools/classrooms/higher education.

Participant Interview Codes

Code	Comment
Funding Availability	Funding available to the language revival program both from within the nation and/or outside of the nation.
Games	Digital games used to promote language learning and acquisition.
Hardware	Physical forms of technology (hardware) are readily available or not readily available. For example, access to computers, computer lab, cell phones, CD players, recording devices, etc.
Independent Learning	Students who follow a self-paced course in their language learning.
Instructor Availability in the Target Language	The availability of instructors in teaching in their target language.
Internet Connectivity	Reliable and consistent access to Wi-Fi within home communities of language learners.
Knowledge Dissemination	Communicating and sharing knowledge with target audiences.
Language Bullies	The use of force, threat, or coercion to intimidate or aggressively dominate other learners.
Language Targets	To whom is the language learning targeted (adults, youth, children).
Motivation	The extent to which learners are internally or externally motivated to learn the language.

Participant Interview Codes

Code	Comment
Omitting traditional learning	The use of digital forms of learning and omitting intergenerational methods of language transmission (intergenerational).
Omitting Elders	Using technology in place of Elders to learn an ancestral language.
Portability	The ability to take language learning and language learning devices with the learner (portable devices).
Preference for traditional methodologies	Teacher/Educator/Elder preferences for using traditional tools such as written texts, oral communication, non-digital/non-technological forms of transmitting knowledge in traditional teaching methodologies.
Spirituality	The spiritual exchanged embedded in intergenerational language transmission.
Student Voice	Students input into the course learning - recognizing values, opinions, perspectives, cultural diversity, and instructing using student passions, interests, and ambitions.
Technological Tools for Ease of Teaching	Technological tools, software and hardware, so support language teachers in their classrooms - making implementing language easier.
Technology weakens the mind	Technological devices and learning digital learning platforms become replacements for the use of one's mind.

Participant Interview Codes

Code	Comment
Technophilia	Defined as a strong enthusiasm for technology, especially new technologies such as personal computers, the Internet, mobile phones and home cinema. In this context, Technophilia refers to the enthusiasm in incorporating technology into the language revival process (i.e. Elders using in lesson planning and delivery, community initiatives to incorporate technology into language revival projects).
Trauma	Where students' previous (traumatic) experiences in the classroom environment impact their current ability to learn their ancestral language.
Value of language	A community of learners and (or) teachers who place language revival in high regard, promoting the use of ancestral language and value its role in cultural and community development.
Youth	Awareness of youth culture and current media/social media trends in learning with passing traditional knowledge and values. Balancing traditional knowledge, values and beliefs with current orientations towards digital technologies and social media usage.

Appendix D

Participant One Transcript

“Before starting, I would like to remind you that at any point, should you feel uncomfortable or unable to continue with the interview, you may request the interview to end without any repercussions. You will still receive the honorarium for your time, and you may choose to include or exclude your previous responses in the study.

As we are conducting the interview online, it is important to note that we have taken every measure to protect your privacy. However, there is a minimal risk given the nature of digital technology. I would also like to remind you that this interview will be audio recorded. To protect your privacy, I would like to invite you to provide a pseudonym if you wish. The pseudonym will be the name that you will be identified as in the research paper. How would you like me to address you during the interview? How would you like me to identify you in the research paper?”

Well the last part of what you said was kinda fuzzy so

How would you like me to refer to you in the research paper and throughout the interview?

You can call me Marilyn you don't have to use my last name, but you can call me Marilyn I'm fine with that

Ok, thanks so much, Marilyn so could you tell me a little about your knowledge and experience using technology and your ancestral language?

I think it's, very minimal so at least my experience in working with it so um myself not personally like I don't uh a lot of the students here use the app the language app, myself I don't

I prefer the dictionary I prefer written material myself, but I know that there's lots of the students that use it in within the classroom. And I think within the classroom we don't necessarily because people are coming into the class we don't use technology in the form of you know like online learning, I think that there is um use in terms of some apps that do games um and um some classes where we are trying to get the students to um you know create games for their classrooms and also doing recordings of fluent speakers and then posting them online. How much of that is done is dependent on the instructor so but we do have a course that is specifically around that them using the um trying to get the students to create online material for online um I think in this next coming year we are going to be looking at developing programming where we are enabling language teachers to look at what programs are out there that they can utilize to teach distance learning and online primarily because we have so many people who live in the communities don't have access to teachers And well maybe live in a city or town where there is no language learning specific to their tribe the program that we want to do is um no specific just to Cree or Dene

Do you find that Wi-Fi connections are a challenge with some of the communities?

So as an institution I think that we've tried to have online classes and the platform we have used the most is moodle, and that didn't seem to work but I think that we've been using with Allyson's influence Adobe Connect and I think that will um be a lot easier but we still have the problems of peoples connectivity in their home communities so um we have one person that's in our masters class that we've been having trouble getting connected and he lives in Manitoba so it's a long drive for him he can't really come in every week um in our communities I think it depends on the community like say Piikani my nieces lives there so I know a bit more about that they have I think excellent connectivity within the nation and partly because of her

work in IT our reserve in Saddle Lake there's like dead zones so if you go like to the community hall for any community event you're not going to get any internet access or even any phone access and we're not really isolated so that's an interesting thing. Can't hear you?

That is interesting. I'm just wondering, are there advantages or disadvantages that you can see?

For using technology?

Yes, for perhaps developing language learning opportunities for those students in remote or un-remote areas?

I think Um I think there's more opportunities to utilize technology like to use particularly online because I think it brings a larger scope for language learning and knowledge dissemination and um I think if there is effort put into it then whatever difficulties exist would be more likely to be resolved because there is energy put towards it if you say well there's too many problems and you don't pursue it then the problems won't get resolved because nobody's pursuing it nobody's valuing it technology itself hold on I'm going to close my door

No problem

Technology itself I don't think can be seen like as with anything I think this is going to be the thing that's going to help us I think I remember when I was in New Zealand and um in the south island they really made a massive effort and put a lot of money towards the development of resources particularly in using technology but they in the end I think they didn't change the way that they were dealing with things because they didn't see that as really actually helping a great deal in terms of what they were investing and so I think that there is still the importance and the need for creating community and face to face and dealing with people and having interactions um that need to be developed and I think that if you are going to do online learning

there still needs to be that kind of a component that's developed with the people that are involved in that online learning activity so by itself no but it provides for a greater opportunity and then for those individuals that are not in the community where there's not lots of language speakers BC did I think some interesting things with Elders where they had kinda like map sort of processes with um you know um apprentices and masters and I don't know how that worked out like I don't know how you know if people who are older not necessarily feeling comfortable around technology I don't know how that resolved itself, and if they still continue to do that but that might be a group of people that you might want to speak to in terms of that if they still to do that and if that worked out when they did do it

That's lovely, um, you talked a little bit about the Wi-Fi connection as a disadvantage do you see any other disadvantages in moving forward with technology? I know you spoke about having the value of the community as well.

I think I don't really actually know, so it's like here right now what we are doing when we are having this conversation so I don't know if you could translate some of the stuff like you do within a classroom in terms of getting people to talk to each other how readily that would translate into this kind of environment in terms of having people have an opportunity to hear and having an opportunity to speak and having an opportunity to relate to each other so those kinds of classes I don't know how it works because I don't have that experience but if feel like its possible whereas I didn't feel quite that way in the past but I do feel today that there is a possibility that something like that could happen and would be useful and again particularly for those people who can't make it to a place where there is a lot of fluent speakers or a class and there's lots of people like that we haven't explored it enough at least in this area and I don't know who has explored it enough to see how that would work like for me I think it would be

good for those individuals that have to work in a particular place but who have an interest that I would that going to a class or having as place where they can go that's not going to be difficult or arduous in terms of getting connected and they have a sense of community and it's an enjoyable experience then I think they would be more inclined and if its within their home and their schedule their timeline like if they have kids

That's great. Do you anticipate any changes to the role of Indigenous language teachers themselves?

I don't see how the role would change are you talking in the classroom?

I think the classroom or community perhaps.

So for me I think that what needs to occur in our communities is that we need actually true blended school or immersions school that needs to be long range strategies in terms of like what kinds of things the community needs to do to stop language loss and to regain and to help the community rebuild its language capacity and communities are in different places so there is one community where they said they had 34 speakers left so I don't know how big of a school that is and I can't remember which language it was you know it's like sometimes if you think the Cree language it's not as scary than if it was Sutiina language, so Sutiina although it's a Dene language it's a different dialect than the ones that are in Alberta so for them then it's difficult so each community would have to have a different strategy so technology in all of these cases would be helpful in a variety of ways one for the collection and archiving of language data then being able to make that language data usable for people who are wanting to learn other than just storing it and storing it for linguists so that kind of stuff in terms of us as a nations have to figure out how training people to do those kinds of things which are not necessarily teaching the language there collecting the language and archiving it and then those individuals that can take a

look at that and say ok how can we utilize this within the classroom setting or make it available to people so it's relevant soundbites so there's that kind of work then there even within the classroom teachers have to have the ability to use technology so they can make language learning fun so it's not always where it has to be interactive like in the classroom with the teacher and the students but that they are using games to make language learning fun so there's that kind of use for technology we require more material in terms of entertainment so this is not apps and this is not games but this is productions that are done in the language so that's an involvement of technology that is kind of different and maybe we don't think of it that way but those are the things that we also need in our communities or small videos and it's that kind of knowledge it think that some teachers in schools it would be useful for them to know how to be able to do that or lead their students to in doing it because it doesn't necessarily mean that if you have creation of videos it doesn't necessarily have to do or to know that or be tremendously skilled but to be able to lead their students in that kind of creative process but to engage them and at the same time to create resources.. Yes, I don't know if that answered your question.

That's wonderful. Is there anything else you wanted to add to what your community is doing what you do as a college or university is doing?

In terms of technology, well, The biggest problem that we experience and I think the biggest problem that our communities experience is lack of funding, so lack of funding makes everything difficult and it makes things stop and start so what we're involved in right now in terms of our language programming as I said we do have courses where we are working with the students to look at how they can incorporate technology particularly in terms of disseminating information so acquiring the information and disseminating it online and getting used to that we

are in the process of developing a certificate program for language teachers so that they can be able to develop online courses for their nation so Blackfoot's can provide Blackfoot language classes for Blackfoot's who live all over the world same for other language groups so I think that will require a greater understanding of the different platforms and also the different the ways you can manipulate games within those platforms with our teachers people who are wanting to be language teachers it is definite that we need to have them be skilled in terms of having a comfortableness in with working on line and working online games for the classroom and I think that is going to change the more young people we have so a lot of the people we have had have been older and not as comfortable with technology and so I think that's going shift as we get younger people into the program and who will not have a problem with and want to do things online we are working with creating a dictionary app we are creating a dictionary that will also act as an archive for our nation communities so working with it does not have the capacity yet to be an online application you know an online dictionary I don't know if we will look at that but we are very interested in looking it as an archive for our teachers and so that they can access resources and collectively you know together so I think that's one of the things it's like everybody working in isolation so were hoping that at least for our seven communities with this particular program that we can create a collective community in terms of keeping teacher resources videos and audios because each of the communities has their own you know like does a certain amount of work in terms of collecting data but not necessarily do they have a way of storing it and not necessarily do they have a way of sharing it and so this would hopefully give them the opportunity and maybe the comfortableness because it is just within the seven communities that own blue quills I think that's all I have for right now.

END OF RECORDING

Appendix E

Participant Two Transcript

“Before starting, I would like to remind you that at any point, should you feel uncomfortable or unable to continue with the interview, you may request the interview to end without any repercussions. You will still receive the honorarium for your time, and you may choose to include or exclude your previous responses in the study.

As we are conducting the interview online/by phone, it is important to note that we have taken every measure to protect your privacy. However, there is a minimal risk given the nature of digital technology. I would also like to remind you that this interview will be audio recorded. To protect your privacy, I would like to invite you to provide a pseudonym if you wish. In the thesis paper you will be identified by participant number 1,2,3, etc. or by your chosen pseudonym if you wish. How would you like me to address you during the interview? How would you like me to identify you in the research paper?”

Previous introductions, checking in to how she is feeling, etc.

****BEGIN RECORDING****

Thank you so much for offering to do the interview, I know you are such a busy lady and have so much going on right now

Yep

Should we get right into it, so we don't take up too much of your evening?

Yes please

, Ok perfect, thank you so much, I guess the first question that I had was can you tell me a little bit about your experience using technology in reviving your language?

In doing my language?

Yes

Well I guess there was no computers when I first started to work in 1986 here so **1:17** unknown phrase and then the computers came in 1992 for the faculty teaching the courses so it's a good thing I learned to type younger because it became useful for me to start typing and I thought this is a good tool although some of the Elders said we should not use the media or you know the computers or things like that and I sort of went against it because I thought it was another way to keep the language using it like you know to teach like by you know instead of writing on the board it takes a long time you could write it on lessons and you can make changes if you wanted to and you show the students and so that's how I began and I thought this is really neat because when I began teaching in 1986 there was no course texts or anything so I began to document the language, what I know anyway and I asked the students what is it that they would like to learn so from there I developed a curriculum for them.

That's fantastic and you are still teaching today at the university.

Yes, I retired in 2004 but I'm still teaching part-time, I teach internet course and language in May June July and August and I also teach Anishinaabemowin on the land course where students come together once a month for two and a half days and we do all kinds of things so there's stories, taking records, or they can use the medium to do some of their lessons.

And do you see a difference between the on the land learning and online learning?

Ya, the one that's a course that's longer, this one's just half a course and the ones that take the course full time that's a full course and the ones that take the full course are more advanced than the ones that take the half course.

What do you see are advantages in using technology to move the language forward?

Oh they can see like if I teach any items they are right there, they see them, they hear them when I say it and you know they go through all kinds of things, I have developed a thesaurus for a language course where students can look for what does that mean, is an animate noun, an inanimate noun, is it singular, is it plural, or whatever, they can do their own research if I ask them this is the sentence here I would like you to translate or this is what you want to say.

Do you see any disadvantages of using technology? I know you mentioned earlier that some of the Elders were against it in the beginning, do you see any of those disadvantages today?

Well, we're finding ways and needs, like if you are just doing the internet course you don't get to see them one on one but you can do like voice recording and they can get together and what I've learned is to have kind of a talk session, whatever time we make a date, Shirley will be available at this time for an hour so if you need help you know get on the course, students hear what other students are asking and I tell them so we have like a conversation.

Do you anticipate changes to the role of Elders with language teaching, do you see them using it more or technology taking the place of the Elder or the role of the Elder changing moving forward? Will technology possibly take a different role in how Elder's teach?

Some of the Elders don't know how to type or don't use the media, or other young people I always tell them to ask their granddaughters or grandsons to help them look for other materials that are out there because when I started teaching there was no language materials, but there is quite a bit now on websites and that for them to look for if they want to and there's also people

everyday people maybe have 10 words and they put the word with the item so they know what it's called. Like last night I saw somebody type the four sacred medicines and they put a picture on the page and when they see it and when it is written it is also learned.

Has it changed how you've taught language as a teacher?

Ya, I seem to use more using how to teach by talking about it, like on PowerPoint presentations so they can see what I'm talking about and they can read the writing and if we do a lesson I can write the words there and they can pull them out.

Is there anything else you wanted to add in terms of teaching language using technology?

Oh there's a lot we can, too many to mention but you know when you have lesson plans or an exam or whatever, there's multiple choices or seek word or there's a puzzle they can work on, it's so much easier and sometimes now the computer corrects it for you so it makes it a lot easier for teachers to do these things.

Do you see maybe using it in your on the land course you mentioned earlier? Do you see yourself using technology when you are out on the land too or is that something separate?

Oh ya, we teach on the land course we teach medicines, rocks, stones, water, different kinds of water, they feel it, bugs, when they do research, they have to do five or ten words about certain bugs or certain items that are written on there, whatever they wish. So I tell them stories about the names of the trees, what they are good for legends what our Elders tell us when our creator made the land, Nanabush asked the tree every kind of animals what is it they would like to give to the people that are coming, so the plants and trees all gave what they could to the people to use.

Was there anything else you wanted to add? What I will do is go through what we have spoken about and transcribe it for you to review and edit if you wish so that when I do the thesis

writing I am representing your words accurately. Then you will have had the chance to say yep that's good or no take that out or change here. Can I send that to you by email?

Oh yes send it by email. And also when I was doing research I found that there was a lot of material for adults and young kids but there wasn't any for intermediate young people learning like high school so we asked the Elders so why is that and they said well why don't we ask them what they want to learn because we were finding they weren't taking the language courses and what they were saying is that I don't have to learn the language I'm Indian, you know, I don't have to learn it because their homemade and they don't take pride in their language, they're ashamed of it, so we went to the Elders and asked them how can we turn that around, how can we turn the negative attitudes to positive attitudes so they told us many things and they told us why don't you ask them because the ministry of ed tells us what to teach not what they want to learn so he said he told me to go and find out and so I did. So as an example, I went to three different classes and in one of the classes I asked them the same thing, if there was a course offered would you take it and why not and how useful would it be to you and so there is one little boy who kept putting his hand up and putting his hand up and I said ok you, he says to me ok I belong to a hockey team and we're always losing, the other team always wins and we never win so perhaps I can learn the language, we can learn the language as a team and we can speak to one another in our own language perhaps we can win our game. So, I thought gee that's a good answer, and I told him that's a good answer nothing wrong with that so I says what would you like to learn and he says hockey, hockey words, and so I developed a hockey CD Rom. All my things I have developed are at goodminds.com so if you look under my name and under the Ojibwe language my name will come up and you will see all the resources I've developed so far.

I love that you went back and asked them what they wanted to learn, you're right so often the ministry of ed says you need to learn this but it's not necessarily going to get them in and learning it.

So, the lot of teachers they don't teach because sports are not academic but anyway, what other teachers have done is if the students finish their work early, they can go back to the back of the room and listen to the hockey CD.

That's a great way to incorporate the language learning into the classroom.

So, there's a word and when they click on it, it's in English and when they click on it comes into Anishinaabe language tells you and says it and you can go onto the next one. It's got a lot of hockey equipment, numbers on sweaters, sizes, hockey rules, hockey equipment, values of hockey, like one of the little boys says how do you say stay out of the penalty box, so there's one of the rules we didn't have and I spent almost a whole year researching about the hockey games, looking for men who played hockey who were fluent speakers just to ask them how do they say that.

Have you seen a lot of language growth in the past few years?

Oh ya, a lot more than when I started.

And I think there's more, I wonder if technology has made it more readily available, like using the internet and accessing the language online.

Oh ya, for the language teachers, we ask them to write to each other in their own language so we can provide the language and keep it that way.

It sounds like you are doing amazing things. Is there more you would like to add?

Oh, there's a language conference we always provide and it's called Anishinaabemowin Teg Incorporation it's always at the end of March because March it was declared languages by

the Assembly of First Nations. That we should use the language, it's a celebration and we should own it so we celebrate it with a language conference for four days. And this year is the 25th anniversary, it's on the website Anishinaabemowin Teg website.

I want to say thank you so much for talking with me tonight, I will transcribe what we talked about and send it off to you.

****END OF RECORDING****

Appendix F

Participant Three Transcript

“Before starting, I would like to remind you that at any point, should you feel uncomfortable or unable to continue with the interview, you may request the interview to end without any repercussions. You will still receive the honorarium for your time, and you may choose to include or exclude your previous responses in the study.

As we are conducting the interview online/by phone, it is important to note that we have taken every measure to protect your privacy. However, there is a minimal risk given the nature of digital technology. I would also like to remind you that this interview will be audio recorded. To protect your privacy, I would like to invite you to provide a pseudonym if you wish. In the thesis paper you will be identified by participant number 1,2,3, etc. or by your chosen pseudonym if you wish. How would you like me to address you during the interview? How would you like me to identify you in the research paper?”

***Participant 3 had challenges meeting online/by phone for an interview. The questions were sent via an online messaging service to which they responded below.

1. What do you see are the advantages of using technology to teach your language?
 - The language will be preserved on these memory banks [digital online resources] as long as there is power [electricity].
 - The sharing of the language is unlimited in terms of accessibility.
 - The language can be shared long distant from computer to student, for example overseas.

- Language can be carried on the phone/laptop anywhere.

2. What do you see as disadvantages in teaching your language?

- If there is a power outage (long term) the language is not accessible on the computers
- The proper pronunciation of words/phrases can be misinterpreted without the assistance of an Elder/speaker.
- Technology can create a greater rift/separation between a family, it has been known to break families apart.
- The spiritual exchange between Elder and learner is interfered with.

3. Does the role of the language keeper/teacher/Elder change with people using technology to learn their language?

Yes, the roles are changed drastically. Anyone can access the language internet information, and the Elders can be omitted from the learning process.

Some other advantages of fusing language and technology are:

1. Promotes independent learning, many students don't do well in a classroom (stress) environment, however, some students excel with home computer learning.
2. Some students can't keep up with the pace of the teacher and curriculum, learning language with a computer aids in confidence as well as helps the student learn at their own pace.

3. Some language learners can learn with the assistance of a speaker, yet there are many whom have traumatic experiences associated with the language, so these students learn better without the direct assistance of a teacher, Elder, etc. and no drama.
4. No heavy bags filled with books to carry around, many students enjoy the fact of carrying a small tablet for learning.
5. It is cool that students will be able to learn their language with a computer but it is even more exciting that students can increase their computer skills with a computer and its many programs. They will learn how to make language videos, language audio recordings, gaming language programs, art language programs, special effects programming, interviewing programs, and so much more with language and computers.
6. Traditionally, it was the parents and grandparents whom taught everything in the language, having access to computer technology will expand their horizons, about the uses of dialects, and other territories languages beyond the family teachings.
7. Having technology and language is preparation of sorts for many learners, they will not only learn their language but will also make new connections with other speakers, access to videos and other learners which in the past wasn't so available.

8. I like that students are sharing their knowledge of the language with other learners, they use skype and other media platforms to inspire, motivate other learners.
9. The internet language courses can offer a student different levels of language experience to people on their language journey.

Some other disadvantages:

1. Some great internet resources charge money for learners to pick up their endangered ancestral languages, some fees I've seen are 40\$ a class on Skype by B. Robinson.
2. Accuracy of the language and finding one's community dialect is challenging for many students.
3. The sources of the language information can be muddled and confusing for some students.
4. Some people will become lazy; they will only use the technology when the need arises but will not use it daily.
5. We know that computers can be super addictive and disrupt family time.
6. As we know that computers are the fastest growing addiction in the world, surpassing religion, it can be used to further the disconnection from living teachings and Elders.
7. Unfortunately, we know that there will be unknown elements in the language learning and media platforms. One of the biggest concerns are the language bullies, those people whom attack other learners without having fear of consequences.

8. Some people can grow more dependent on technology and ignore the teachings of the Elders. Some people have been known to use technology to overthrow an Elders language sharing and thus Elders feel threatened and withdrawal aiding learners.
9. Cultural traditional teachings are not practiced in technology; many believe that technology is not a part of traditional learning.

I also wondered if you use any technology in your teaching/language learning and if you had any example of Elders/language teachers' roles feeling threatened with the use of technology?

When I was learning the teachings, and my language, the speakers and Elders forbade me from writing or voice recording their talk (back in the 1980's – 2000). As I got older the Elders told me that too many living libraries are passing away. They gave me permission to use technology in my Language learning and sharing. Only till I got their permission; did I begin to handwrite the lessons of theirs. This was a process starting with handwriting and diagramming their teachings in personal journals for my own training. Years later I was introduced to a typewriter, years following technology came into play which opened up a whole bunch of doors and avenues to share. Because I was raised with the oral teachings, and the art of using mind-memory connection I will always fall back to this technique yet because technology is becoming the primary communication between many people, I will share happily any and all language teachings. I will not share any medicine practices, teachings through the internet technology because one of the most valuable components of the teachings in the sacred Exchange of spirit and heart that is involved in passing on the teachings. The Exchange of Spirit and Heart is not as

effective with technology. There has to be a physical presence, a personal attendance when sacred medicine is being exchanged.

I attended a language gathering a few years ago, I asked my helper at the time to make a recording of the speakers, not a video but a voice recording so it may be reviewed later. There was two Elders among many whom stood up proud and committed to their message to the learners. Once Elder shared “We don’t record or document the language because there are sacred signatures, teachings in the language. This is a form of disrespect to those whom have suffered, are suffering and whom have died to keep the language alive. The second Elder in question shared that this technology is but another tool of lessening our relationship and replacing the speaking Elders. We should not record with audio, video or written for this weakens the minds of the people. They will become more dependent on this technology and more than the skills, abilities of their minds. Eventually, the Elder speakers will be discarded and pushed aside out of the sacred circle and these computers will take the place where Elders belong.

I recall years later, another Elder speaking on matters of technology and traditional ways, he said something to the effect of “The younger generation have always without question turned to Elders experiences and historical witnessing, yet today our young will contest the Elders using this technology and its accumulated knowledge as a tool of dominance over the Elders experiences. This technology will break the sacred circles, within family and community and eventually it will pollute the medicine ways.”

When I quote what you have shared how would you prefer to be identified? Do you teach in the classroom or offer language teachings to the community?

Kanzeegitimido is the name I use. Yes, I share my experiences and those of Elders passed within Colleges, Universities, High Schools, and various other learning institutions (too many to mention). My favourite helping is done in the bush, taking youth and parents out on hikes and sharing what I know. I will be doing a week trip with the University of Toronto class, on the land teachings, it will be incorporating survival classes, plant and tree identification and edible/medicinal uses, storytelling with ceremony mixed with modern academic learning.

Appendix G

Observational Grid Asynchronous Online Course Comparison

Observational Grid Asynchronous Online Course Comparison

Pedagogical Strategy	Course 1 (Sault College)	Course 2 (University of Wisconsin Eau Claire)
Making opportunities for the learner to talk	2	4
Expecting the learner to talk or respond (Wait Time)	2	4
Asking questions to confirm understanding	1	3
Speaking in the target language – teacher and student	1	3
Focus on verbs	3	3
Interaction in online discussions	2	3
Reflection of learning	3	4
Intentional small and large group design	1	2

Appendix H

Elder Transcripts Coded Sentiment

Code	Comment	Grounded	Code Groups
Ability to Implement Technology	Elders' capabilities in implementing technology in the language learning classroom.	12	Neutral Sentiment
Access to differentiated learning experiences	Using technology to differentiate teachings to meet students' needs and enhance student learning experiences.	1	Technophilia Access to current technologies, ICT, and Wi-Fi
Accuracy of the dialect	How accurate or inaccurate the pronunciation or dialect of the teacher(s) in the online learning course(s).	2	Positive Sentiment Negative Sentiment
Combining Traditional Teachings with Technology	Elders and language teachers using technology combined with traditional teaching methods and/or traditional on the land classrooms.	1	Spirituality, Culture, and Traditional Language learning practices
Comfort	Level of comfort of elders/language teachers in incorporating technology into their language lessons.	7	Positive Sentiment Neutral Sentiment
Connectivity	Reliable Wi-Fi connections are readily available (or not readily available) for learners.	4	Access to current technologies, ICT, and Wi-Fi
Cost of individual courses	The cost of each individual course paid by each individual student.	1	Neutral Sentiment Funding for technology and language programs
Culture teachings not practiced in technological platforms	To what extent cultural teachings are not imparted through digital learning.	4	Negative Sentiment Spirituality, Culture, and Traditional Language learning practices Negative Sentiment

<i>Elder Transcripts Coded Sentiment</i>			
Code	Comment	Grounded	Code Groups
Digital Addiction	Dependence on digital technologies; individuals compulsivity in using digital technology.	2	Negative Sentiment
Disconnect from family and friends	Digital technologies are creating a rift or divide between family relationships.	4	Negative Sentiment
Disrespecting the past	Using technology disrespects the history embedded within the language and language transmission.	2	Negative Sentiment
Elder Assisted Learning	The extent to which elders assist in the language learning process through intergenerational transmission.	2	Positive Sentiment
Elder sense of threat	Elders feel that their role is threatened by the inclusion or overdependence on technology to learn ancestral languages.	3	Resistance Negative Sentiment
Face to Face Community	A group of students and/or educators engaged in a face-to-face language learning community.	6	Positive Sentiment
Games	Digital games used to promote language learning and acquisition.	6	Technophilia Access to current technologies, ICT, and Wi-Fi
Hardware	Physical forms of technology (hardware) are readily available or not readily available. For example, access to computers, computer lab, cell phones, CD players, recording devices, etc.	9	Positive Sentiment Technophilia Access to current technologies, ICT, and Wi-Fi
Independent Learning	Students who follow a self-paced course in their language learning.	2	Negative Sentiment Positive Sentiment
Internet Connectivity	Reliable and consistent access to Wi-Fi within home communities of language learners.	2	Access to current technologies, ICT, and Wi-Fi Neutral Sentiment

<i>Elder Transcripts Coded Sentiment</i>			
Code	Comment	Grounded	Code Groups
Knowledge Dissemination	Communicating and sharing knowledge with target audiences.	5	Archiving and Knowledge Dissemination
Language Bullies	The use of force, threat, or coercion to intimidate or aggressively dominate other learners.	1	Positive Sentiment Negative Sentiment
Language Targets	To whom is the language learning targeted (adults, youth, children).	2	Neutral Sentiment
Motivation	The extent to which learners are internally or externally motivated to learn the language.	2	Positive Sentiment Neutral Sentiment
Omitting traditional learning	The use of digital forms of learning and omitting intergenerational methods of language transmission (intergenerational).	4	Negative Sentiment
Omitting Elders	Using technology in place of elders to learn an ancestral language.	4	Negative Sentiment
Spirituality	The spiritual exchanged embedded in intergenerational language transmission.	3	Spirituality, Culture, and Traditional Language learning practices
Student Voice	Students input into the course learning - recognizing values, opinions, perspectives, cultural diversity, and instructing using student passions, interests, and ambitions.	3	Positive Sentiment Positive Sentiment
Technological Tools for Ease of Teaching	Technological tools, software and hardware, so support language teachers in their classrooms - making implementing language easier.	3	Technophilia Access to current technologies, ICT, and Wi-Fi Positive Sentiment

Elder Transcripts Coded Sentiment

Code	Comment	Grounded	Code Groups
Technology weakens the mind	Technological devices and learning digital learning platforms become replacements for the use of one's mind.	1	Negative Sentiment
Technophilia	Defined as a strong enthusiasm for technology, especially new technologies such as personal computers, the Internet, mobile phones and home cinema. In this context, technophilia refers to the enthusiasm in incorporating technology into the language revival process (i.e. Elders using in lesson planning and delivery, community initiatives to incorporate technology into language revival projects).	14	Technophilia Positive Sentiment
Trauma	Where students' previous (traumatic) experiences in the classroom environment impact their current ability to learn their ancestral language.	1	Negative Sentiment
Value of language	A community of learners and (or) teachers who place language revival in high regard, promoting the use of ancestral language and value its role in cultural and community development.	11	Neutral Sentiment
Youth	Awareness of youth culture and current media/social media trends in learning with passing traditional knowledge and values. Balancing traditional knowledge, values and beliefs with current orientations towards digital technologies and social media usage.	7	Positive Sentiment

Appendix I

Adjusted Word Frequency Count

Word	Marilyn	%	Shirley	%	Kanzeegitimido	%	Total	%
access	4	0.16%	0	0.00%	3	0.22%	7	2.51%
audio	1	0.04%	1	0.05%	2	0.15%	4	1.43%
changes	1	0.04%	2	0.09%	0	0.00%	3	1.08%
communities	12	0.48%	0	0.00%	0	0.00%	12	4.30%
community	14	0.56%	0	0.00%	3	0.22%	17	6.09%
create	4	0.16%	0	0.00%	1	0.07%	5	1.79%
creating	3	0.12%	0	0.00%	0	0.00%	3	1.08%
dependent	1	0.04%	0	0.00%	2	0.15%	3	1.08%
developed	2	0.08%	5	0.23%	0	0.00%	7	2.51%
developing	3	0.12%	0	0.00%	0	0.00%	3	1.08%
dictionary	4	0.16%	0	0.00%	0	0.00%	4	1.43%
difficult	3	0.12%	0	0.00%	0	0.00%	3	1.08%
exchange	0	0.00%	0	0.00%	1	0.07%	3	1.08%
experience	6	0.24%	1	0.05%	1	0.07%	8	2.87%
experiences	0	0.00%	0	0.00%	4	0.30%	4	1.43%
family	0	0.00%	0	0.00%	4	0.30%	4	1.43%
feeling	1	0.04%	1	0.05%	1	0.07%	3	1.08%
games	6	0.24%	1	0.05%	0	0.00%	7	2.51%
home	2	0.08%	0	0.00%	1	0.07%	3	1.08%
identified	1	0.04%	1	0.05%	1	0.07%	3	1.08%
individuals	3	0.12%	0	0.00%	0	0.00%	3	1.08%
information	2	0.08%	0	0.00%	2	0.15%	4	1.43%
involved	2	0.08%	0	0.00%	1	0.07%	3	1.08%
knowledge	3	0.12%	0	0.00%	2	0.15%	5	1.79%
land	0	0.00%	6	0.28%	1	0.07%	7	2.51%
media	0	0.00%	2	0.09%	2	0.15%	4	1.43%
medicine	0	0.00%	0	0.00%	3	0.22%	3	1.08%
opportunity	5	0.20%	0	0.00%	0	0.00%	5	1.79%
place	3	0.12%	1	0.05%	1	0.07%	5	1.79%
platforms	2	0.08%	0	0.00%	2	0.15%	4	1.43%
privacy	2	0.08%	2	0.09%	0	0.00%	4	1.43%
problem	4	0.16%	0	0.00%	0	0.00%	4	1.43%
problems	3	0.12%	0	0.00%	0	0.00%	3	1.08%
programming	2	0.08%	0	0.00%	1	0.07%	3	1.08%
protect	2	0.08%	2	0.09%	0	0.00%	4	1.43%
recording	0	0.00%	1	0.05%	3	0.22%	4	1.43%

Adjusted Word Frequency Count

Word	Marilyn	%	Shirley	%	Kanzeegitimido	%	Total	%
research	3	0.12%	4	0.19%	0	0.00%	7	2.51%
resolved	3	0.12%	0	0.00%	0	0.00%	3	1.08%
resources	4	0.16%	1	0.05%	1	0.07%	6	2.15%
sacred	0	0.00%	1	0.05%	5	0.37%	6	2.15%
share	0	0.00%	0	0.00%	4	0.30%	4	1.43%
shared	0	0.00%	0	0.00%	4	0.30%	4	1.43%
sharing	1	0.04%	0	0.00%	5	0.37%	6	2.15%
speak	2	0.08%	1	0.05%	0	0.00%	3	1.08%
speakers	4	0.16%	1	0.05%	4	0.30%	9	3.23%
storing	3	0.12%	0	0.00%	0	0.00%	3	1.08%
time	2	0.08%	6	0.28%	2	0.15%	10	3.58%
together	1	0.04%	2	0.09%	0	0.00%	3	1.08%
tool	0	0.00%	1	0.05%	2	0.15%	3	1.08%
traditional	0	0.00%	0	0.00%	3	0.22%	3	1.08%
translate	2	0.08%	1	0.05%	0	0.00%	3	1.08%
videos	3	0.12%	0	0.00%	2	0.15%	5	1.79%
voice	0	0.00%	1	0.05%	2	0.15%	3	1.08%
wish	1	0.04%	4	0.19%	0	0.00%	5	1.79%
word	0	0.00%	3	0.14%	0	0.00%	3	1.08%
write	0	0.00%	3	0.14%	0	0.00%	3	1.08%
writing	0	0.00%	3	0.14%	1	0.07%	4	1.43%
written	1	0.04%	2	0.09%	1	0.07%	4	1.43%
young	1	0.04%	3	0.14%	1	0.07%	5	1.79%
younger	1	0.04%	1	0.05%	1	0.07%	3	1.08%

Appendix J

Data Collection Tools

Research Question	Data Used to Answer Research Question	Data Analysis to be conducted
What benefits, drawbacks, and preferences do Elders currently using technology identify in using digital technologies to revive an at-risk language?	<ul style="list-style-type: none"> • Semi-structured interviews • Classroom observations 	<ul style="list-style-type: none"> • Thematic analysis • Data-driven inductive approach (Boyatzis, 1998) • Deductive coding (Crabtree & Miller, 1999) • Participant reviews • Asynchronous classroom observations

Appendix K

Steps in Data Collection

Tasks	Outcomes	Next Steps
Email, phone, meet with Elders, Community Support Workers, Cultural Workers to gather interested participants based upon the selection criteria.	Community and Cultural workers identify potential participants.	Contact Elders via phone, email, in person. Offer the gift of tobacco, where appropriate, when requesting participation in the study.
Review participant requirements and identify participants eligible for the study (Questionnaire).	Elders interested in participating in the study are asked to complete a questionnaire to ensure eligibility.	Completed questionnaires are reviewed, candidates not meeting the criteria are notified, thanking them for interest; however, that they do not meet the requirements for participation. Participants meeting eligibility criteria are identified, and two participants are selected to participate via phone or online. The third participant chose to connect via messaging service.

Steps in Data Collection

Tasks	Outcomes	Next Steps
Contact eligible participants and give consent form, receive a response and consent forms returned.	Consent forms provided.	Eligible participants were contacted and notified of eligibility, asked to give oral consent, given the opportunity to ask questions and have any concerns answered.
Interview each participant using the interview questions outlined in Appendix A, using a digital recording device.	Meet with each participant, review expectations, reiterate that there may be times of discomfort, and they may withdraw from the study at any time, remind participants of confidentiality and anonymity during the process, discuss the use of recording devices and that all data will be kept anonymous, where it will be kept and what will happen to the recordings upon completion of the study.	Upon completion of the interview process, participants will be informed that they will be notified when transcription is complete for their review. Participants will receive a copy of the transcribed interview for review. Upon review, they may make suggestions, clarify, or provide further explanation.
Transcribe the data (interview responses) from the devices.	Interviews will be transcribed word for word for coding and participant review.	Participants will receive a copy of the transcribed interview for review. Upon review, they may clarify or provide further explanation.

Steps in Data Collection

Tasks	Outcomes	Next Steps
Have participants review transcription to ensure that their Responses are accurate (participant review)	Participants can clarify their responses.	Any additions, deletions or clarifications will be noted in the participant review of the transcription and included in the dataset.
Begin to read through transcripts looking for commonalities and themes	Common themes will be identified through the transcription review; data is coded into various themes.	Code the data identifying themes.
Identify themes and commonalities – review with Elders to assess accuracy or interpretations	Additions and clarifications included in data transcription. Common themes between participants' transcripts are identified.	Address what the common themes in the data suggest.
Review two asynchronous Indigenous language classes (Anishinaabemowin) using an observation grid (Appendix G).	Common themes will be identified through the asynchronous classroom review.	Use data collected in the asynchronous classroom observation to compare to the data collected from participant interviews.