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The Role of ICTs in Native American Owned Micro-Enterprises-A Framing Analysis

Jie Xiong
University of Nebraska at Omaha, jxiong@unomaha.edu

Sajda Qureshi
University of Nebraska at Omaha, squreshi@unomaha.edu

Teresa Trumbly Lamsam
University of Nebraska at Omaha, tlamsam@unomaha.edu

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Jie Xiong
University of Nebraska at Omaha
jxiong@unomaha.edu

Sajda Qureshi
University of Nebraska at Omaha
squreshi@unomaha.edu

Teresa Trumbly Lamsam
University of Nebraska at Omaha
tlamsam@unomaha.edu

Abstract

Information and Communication Technologies (ICTs) are seen to be drivers for the development of emerging regions. Many small businesses in the United States, including Native American owned micro-enterprises, are facing unique challenges in the adoption of ICTs to improve business performance. This research follows an inductive qualitative approach to find out which of the factors could potentially lead to the adoption of technologies by Native American micro-enterprises owners. Based on interviews from four Native American owned micro-enterprises, Characteristics of ICTs, Personal Inequality, and Community Engagement are identified as key factors that lead to the adoption of ICTs. The contribution of this study is the identification of these factors, and in the ways in which they relate to each other. This research also offers a cyclical view of relationships between factors that influence Native American micro-entrepreneurs' adoption of technology.

Keywords

Native American Micro-Enterprises, Framing analysis, Empowerment, Economic Development, Information and Communication Technologies (ICTs).

Introduction

In the United States, small businesses, including micro-enterprises currently represent 99.7 percent of all businesses. Over the last two decades, they have generated nearly 64 percent of all new jobs in the country while creating more than half of the nonfarm private GDP (USSBA, 2011; Kobe, 2007; CHI Research, 2003). According to recent data from the United States Census Bureau (2011), there were more than 10 million small businesses operating in the United States. As these businesses are the driving force and the central factor influencing the economic growth and development of communities in the United States, it is important to understand how Information and Communication Technologies (ICTs) can support the growth and maintain the sustainable development of these small businesses (Qureshi & Lamsam, 2008; Chen, Parker, & Lin, 2006; Garsombke & Garsombke, 2000; Varma, 2005).

While it appears that ICTs benefit both developed and developing regions, the recession is still inevitable. For example, unemployment and poverty rates have risen sharply in the United States over the course of the recession. The effect of the recession has been acute in Native American populations, particularly in the Midwest. According to the Pew research center, 1 in 4 Native Americans and Alaska Natives are living in poverty; their unemployment rates rose to 11.3% in 2013 and have the highest unemployment rates in the Midwest of 16.8% (Krogstad, 2014; Austin, 2013; Macartney, Bishaw, & Fontenot, 2013).

In order to investigate which factors affect Information Technology adoption by Native American owned micro-enterprises, researchers in this study used the model developed in Xiong, Qureshi, & Lamsam

(2014) to analyze the data collected in four cases. This research follows an inductive qualitative approach to find out which of the concepts in the model apply to Native American owned micro-enterprises. Open coding is used to identify instances of the categories. Framing analysis is applied to arrive at an understanding of how ICTs can support the development of Native American owned micro-enterprises. Through framing analysis the ways in which ICTs may be perceived and used can be explored from the perspective of micro-enterprises. Data will then be analyzed to show which aspects of the model holds for Native American owned micro-enterprises. This framing analysis of Native American owned micro-enterprises may also enable us to arrive at new categories that are unique to these businesses.

The proposed research is an important step toward examining the challenges faced by Native American micro-enterprise owners. The overall research question being investigated is

What factors influence Native American owned micro-enterprises adoption of technology?

This research will draw upon a model that was developed in previous research to find out which characteristics of ICTs enable economic development and/or empowerment. In order to do so, this research will use data from a set of four Native American owned micro-enterprises in a midwestern city in the United States.

Literature Review

Information Technology for Development (ITD/IT4D) research has made various contributions in providing equitable access to information, knowledge, and welfare in areas such as education (Rodrigues & Govinda 2003; Rodrigo 2003, Scheepers & de Villiers 2000), healthcare (Braa, Monteiro, & Sahay 2004; Mosse & Sahay 2005; Kimaro & Nhampossa, 2005), software development (Chudnovsky & Lopez 2005; Tan & Leewongcharoen, 2005; Han, 2000), reduction in poverty (Cecchini & Scott, 2003; Kenny, 2000; Qureshi, Kamal, & Wolcott, 2009), better government (Tan and Leewongcharoen, 2005; Walsham & Sahay, 1999; Qureshi, 1998), and off-shore outsourcing (Sahay, Nicholson, & Krishna, 2003; Preis-Heje, Baskerville, & Hansen, 2005; Hawk & McHenry, 2005). As Street and Meister (2004) point out, the Information Systems is a solution to address the small businesses' IT needs to main sustainable development. In their research, action research was selected to study a Canadian manufacturing company. Harrison, Mykytyn, and Riemenschneider (1997) use the Theory of Planned Behavior (TPB) to explain the executives' decisions from 162 small businesses. They identify that attitude, subjective norm, and perceived control are key factors to IT adoption. Sadowski, Maitland, and van Dongen (2001) investigate the adoption of Internet software and services in 264 Dutch SMEs and they identify that the small- and medium-sized enterprises (SMEs) have very unique characteristics that are different from big enterprises.

Micro-enterprises, "a sole proprietorship with fewer than five employees" (P.L. 106-102, 1999), face unique challenges during their operations. Schreiner and Woller (2003) identified several challenges such as limited access to financial services, relatively high operation and labor costs, lack of skills and expertise, and education. Servon (2006) also identified the insufficient use of technology in U.S. micro-enterprises. Many small businesses in the United States, including Native American owned micro-enterprises, are facing unique challenges in the adoption of ICTs to improve business performance and achieve economic development.

Native American owned small business

ICTs have been touted as a means of increasing economic development and providing improvements in the livelihoods of people who use them. While most Native American societies tend to be collectivistic rather than individualistic, and entrepreneurialism is associated with the latter. As a 'missing piece' of both research and teaching (Tipton, 2004; "Nebraska Sioux Lean Beef", 2008), the use of ICTs is still a challenge for Native American owned small businesses, especially from women in rural areas of the United States (Aspaas, 2004; Jahrig, 1996). Their unique ways of viewing ICTs means that their frames of reference need to be addressed when considering use of the technologies; in part, the tribal-based focus over individual development is culturally based. (Qureshi & Lamsam, 2008).

The majority of revenue-generating enterprises in Native American communities are tribally owned (National Rural Funders Collaborative, 2014). The businesses owned by individuals are underdeveloped due to several barriers like lack of access to capital and financial service, lack of effective leadership, and

lack of local role models (Dewees & Foxworth, 2013). The Effective State Policy and Practice identifies several challenges Native American small businesses are facing (National Rural Funders Collaborative, 2014). First, there is a lack of business development training and technical assistance resources. Second, there are low levels of general financial literacy. Third, there is inadequate and inappropriate financing for Native American enterprises. There is also a lack of Native American participation in the Computer Science (CS)/Computer Engineering (CE) program (Varma, 2005). The lack of education in computers and computer-related courses in high school, personal motivation, the small number of Native Americans in higher education, and the lack of encouragement from family and friends could be contributing factors influencing the lack of Native participation in CS/CE programs (Varma, 2005). Meanwhile, the Native American schools are also facing several challenges of model digital technologies (Richardson & McLeod, 2011).

Despite the high access and use of ICTs in the United States, already high unemployment and poverty rates among Native Americans continue to rise, deepening existing income inequalities. Although ICT adoption has enabled small businesses to grow, Native American small owned businesses have received little attention or support. Native American small business owners have a more collectivist culture while most entrepreneurship follows an individualistic culture. In addition, the technology is designed to support this individualistic culture. This proposed research project involves the diagnosis of ICT needs and challenges faced by Native American small business owners, selection of technology interventions, implementation of these technology interventions (together with training of the small business owners), and assessment of development outcomes from these interventions.

Economic Development Outcomes

The outcomes from Information and Communications Technology on development can be assessed in a number of ways. The measures of economic development most often used to assess small businesses are: increase in income, job creation and clientele (Qureshi et al., 2009). In their model the arrows are bidirectional because the growth of and development of the businesses can bring about greater IT adoption and lead to more technology being purchased and an improvement in the organization and its environment.

One form of the most profusely written development, Economic Development, can be viewed as the quantitative and qualitative improvement in the economy. It is essential to understand that economic development entails a broader view of economic growth. Malecki (1997) distinguishes the economic growth with economic development. Economic growth "increases in the quantity or the value of the goods and services" (Malecki, 1997, p1), while economic development "leads to qualitative improvements in life" (Malecki, 1997, p1). As Sen (1978, p748) points out, "economic growth is one aspect of the process of economic development." Economic development involves the growth and improvement of factors like literacy rates, poverty rates, employment rate, GDP per capital, access to healthcare, and government investment.

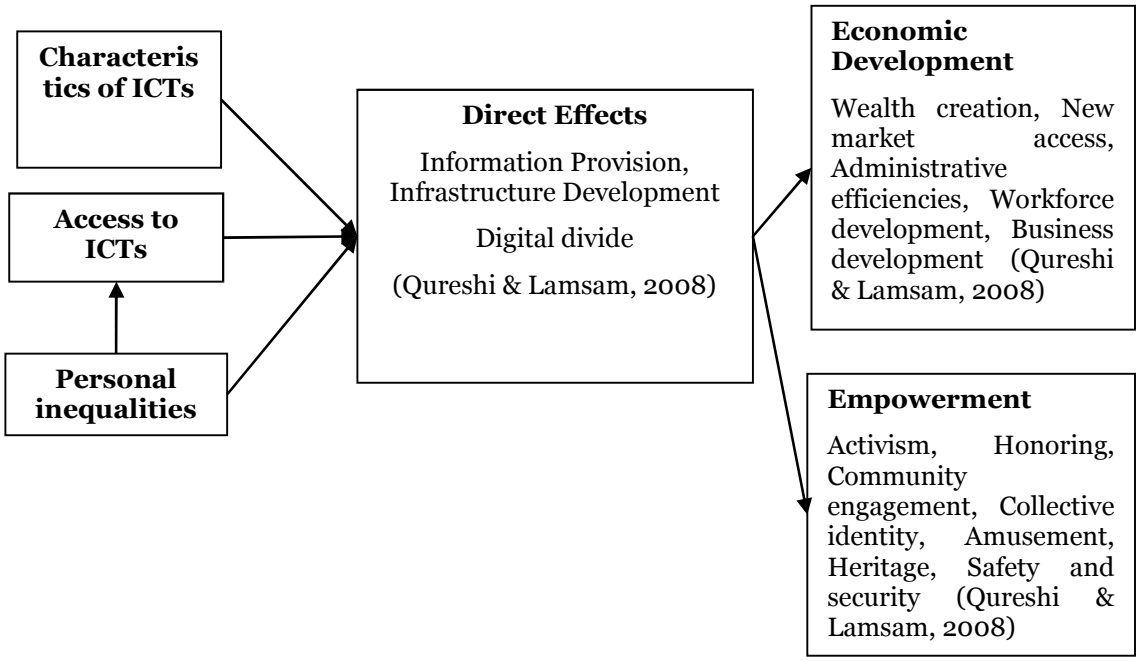
Empowerment

The concept of empowerment has been used to describe power and control in organizations (Qureshi & Lamsam, 2008). In a study conducted by Kimaro and Nhampossa (2005), IT initiatives were found to be top-down, and controlled by the power of top managers who usually do not have adequate skills to do so. Historically, empowerment was viewed as a motivational construct (Conger & Kanungo, 1988). Also, Hughes (2003) identifies that there is a debate about whether women are 'forced' or 'voluntarily' self-employed when there is a broader definition of 'push' factors is used. In this paper the concept of empowerment in the model will be tested from four Native American owned micro-enterprises.

Research Model

This research adopts the model from Xiong et al. (2014). As illustrated in Figure 1, the characteristics of ICTs could directly lead to the direct effects of information provision and infrastructure development. Personal inequalities could lead to different performance on the access to ICTs. The use of ICTs and new media has implications for the economic development and empowerment.

Figure 1. Research model of the effects of ICTs on the Digital Divide of Micro-Enterprise (Xiong, Qureshi, & Lamsam, 2014)



The above model contributes to the trends towards the intersection of two trends in information technology for development: the growing role of SMEs and the use of ICTs (Duncombe & Heeks, 2002). The above model represents IT adoption by African American owned and Native American owned small businesses in their previous research. While it is unclear whether Native American owned micro-enterprises will have unique characteristics in the adoption of technology, this existing model paves way for this research.

Methodology

To investigate which factors affect IT adoption by Native American micro-enterprise owners, we use the above model to analyze the data collected in four cases. This research follows an inductive qualitative approach to find out which of the above concepts in the model apply to Native American micro-enterprises. As "a multi-faceted research approach for IS" (Cavaye, 1996), case study has proven to be a powerful tool to help researchers understand and examines "the phenomenon in its natural setting" (Benbasat et al., 1987). Open coding was used to identify instances of the components in the model. These will then be analyzed to show which aspects of the above model holds for Native American owned micro-enterprises. This framing analysis of Native American owned micro-enterprises may also enable us to arrive at new categories that are unique to these businesses.

Framing Analysis

As a multidisciplinary research method, framing/frames analysis has become popular in social science including studies in communications, media, political behavior, and social movement theory studies (Druckman, 2001; Scheufele, 1999). While there are several definitions about frame/framing analysis, in this research we refer to the "words, images, and presentation styles that a speaker uses when relaying information to another" (Druckman, 2001, p227). In this definition, frames will often play an important role in shaping and reveling the meaning in the thoughts.

In Cornelissen and Werner's (2014) levels of analysis, they identify that at micro level, the cognitive frame, frame of reference, and framing effects are the key research trends. In the meso level, the strategic frame, strategic framing, technological frame, and collective action frames are well observed. In the macro level, field frame, institutional frame, and frame contests/frame alignment are analyzed. Others suggest that a "cognitive leans" can be equipped in observing the changes in technologies (Kaplan & Tripsas, 2008). Barrett, Heracleous, and Walsham (2013) consider framing and ideology to be the central elements of computerization movement theory, and employ framing as a rhetorical strategy for advancing the technology. Leonardi (2011) points out, "culture does not directly shape the technological artifacts" (Leonardi, 2011, p347). As Native American owned micro-enterprises' practices are deeply embedded in their cultural traditions, understanding their frames enable us to access their adoption patterns of technologies.

In this research, framing analysis is used to arrive at an understanding of how ICTs can support the development of Native American owned micro-enterprises. Through framing analysis the ways in which ICTs may be perceived and used can be explored. This approach also help researchers "bridge ideas back in" (Oliver & Johnston, 2000). This framing analysis follows a constant comparison approach in which a wide range of meanings may be revealed through an objective procedure (Song, 2007). "The method begins with scrutinizing one text at a time and proceeds to create tentative categories of frames until a set of categories that are mutually exclusive and exhaustive for all frames comprising the articles is established" (Song, 2007, p 79). Through the framing analysis, this research will potentially build theory from data that was systematically gathered and analyzed from the research process.

Research Setting

This research investigated four micro-enterprises undergoing change through the adoption of ICTs for competitiveness. Each business has been given an arbitrary name for the purpose of this study and to maintain confidentiality of the businesses. All of the businesses are located in Nebraska. In Nebraska, there are about 166,078 small businesses, generating 386,049 job opportunities in 2015 (Small Business Administration, 2015).

1. PIS is a family-owned store. Both the owner and founder are Native Americans. Currently, 0.7% of the population is Native American in this midwestern metropolitan area. The store offers an assortment of turquoise and silver jewelry, bead and quillwork, pottery, Pendleton and saddle blankets, buckskins, arrows, dream catchers, kachina dolls, wood carvings, t-shirts, books, Native American music, teas, herbs, flutes, craft supplies.
2. RIT is a Native American owned micro-enterprise in a small city adjacent to the metropolitan area. They provide different Native American gift services, including Native jewelry, artifacts, and Minnetonka moccasins. The owner of the store is a Native American woman in her 50s. The store is highly engaged with the local Native community. Twice weekly, the store offers Native American embroidery courses. Serving as an information hub for the local communities, regular customers contribute to the majority of the sales.
3. TCO is a Native American owned small business in a medium size city of the metropolitan area. They serve over 90 tribal and Native American health service clinics in 15 states. It was founded in 1993 to provide full service, discount eyeglass program.
4. SPI began in 1992 with selling toothpaste, towels, and concrete barriers to the federal government. It wasn't until 1995, with the passage of the Federal Acquisition Streamlining Act, that the sale of meat and frozen meat products became the dominant sales product for SPI. SPI started manufacturing meat products in a local plant and soon expanded the sales.

Data was collected in the summer of 2014 through open-ended interviews. A total of four Native American owned micro-enterprises were identified based on the criterial for case selection. All of the micro-enterprises are facing challenges in operations, for example, lack of skills in using technologies, lack of resources in identifying the venders, and lack of educations. The micro-enterprises should also have the potential to grow by the usage of technologies. On the other hand, the Native American owned micro-enterprises should exist for more than one year, so that some endogenous variables leading to the challenges can be excluded, for example, lack of cash flow and lack of management.

Data Analysis

In this study, framing analysis is applied to arrive at the understanding and potential new discovery of the adoption challenges faced by the Native American micro-enterprise owners. According to the previous research, Qureshi and Lamsam (2008) provides a set of frames that lead to the understanding of the ICTs and media effects in the digital divide. Based on the Xiong et al. (2014) model, it was identified that the characteristics of ICTs, access to ICTs, personal inequality, direct effects, economic development, and empowerment are the main frames for our research. The coded transcripts reveal labels related to IT perceptions and usage by the micro-enterprise owners. These labels were categorized into frames and tabulated as depicted in the following table 1.

	PIS	RIT	TCO	SPI	Total	%age of Total
Characteristics of ICTs	13	10	4	5	32	44%
Access to ICTs	4	3	3	2	12	17%
Personal Inequality	3	2	1	1	7	10%
Direct Effects	2	1	3	2	8	11%
Economic Development	1	2	2	2	7	10%
Empowerment	2	1	2	1	6	8%
Total	**25**	**19**	**15**	**13**	**72**	**100%**

Table 1. Frames of Micro-Enterprises use of ICT

It appears that Native American owned micro-enterprises face unique challenges during the adoption of technologies. This section describes these in light of the frames that were identified in the transcripts.

Characteristics of ICTs

The majority of labels (44%) related to the different characteristics of the technology as they relate to the ways in which it is used to support the business. Examples of the Characteristics of ICTs are as follows:

PIS: I do conduct business by phone. Sometimes people will ask me different questions online. .... I do have computer at home, but I do not use that for work. I have a Facebook homepage…We will have some promotion information online.

RIT: My Facebook page gets about 500 likes and my big page I got over 3000…, I post things via the computer.

TCO/SPI: We use Gmail. …My iPhone is smarter than me. I use that a lot. I really like that a lot. I also do a lot of texting via iPhone. Anyhow it makes my life easy, I spent my whole winter texting to control the business while I was on vacation.

It appears from the transcripts and frames, the characteristics of ICTs will lead to different adoption towards Native American owned micro-enterprises. Social network service like Facebook and Twitter, appears to offer greater accessibility for the Native American micro-enterprise owners. Free email service provider like Gmail with iOS enabled smartphone also provide strong support for the same group.

While there is a divide between the people who can get access to the ICTs and the people who cannot, it is also important to understand the characteristics of ICTs could potentially lead to different access and adoption of technologies. In a study by Xiong and Qureshi (2012), it is identified that the character of the technology would lead to different access to ICTs between the small businesses in the United States and China. Entrepreneurs should find the suitable ICT and use them properly, in order to better support their

businesses. On the other hand, the characteristics of ICTs could be an important factor during the adoption of ICTs.

Access to ICTs

Although 17% of the labels related to the access to ICT's frame, it appears that access was not a problem. The following transcripts illustrate that the micro-entrepreneurs have differing levels of access to ICTs:

PIS: I use the credit card machine. I have a fax and fixed line telephone. My son just brought a computer to here. But mostly it is for his work. He has products in my store, and he keeps track of them by using the category in the computer.

RIT: Wifi..Several monitors, iPad, and desktop,…I think they are very helpful. I got 4 new [security] cameras.

TCO/SPI: We have secured server for the pricing, so we are not worried about that. That was outsourced to a third IT person.

While there are a number of technologies available and used by the micro-entrepreneurs, it appears that there may be other factors that affect the level adoption of the technology.

Different level of access to ICTs could be an important factor during the adoption of ICTs. For example, the personal inequality, including education, digital literacy, and the structure of technology support. Other factors like external environment including government policy would also influence the different level of accesses of ICTs (Xiong and Qureshi, 2012).

Personal Inequality

There were some inequalities in the ways in which the micro-enterprise owners were able to use the technology to support their business activities. Only 10% of the labels accounted for this frame and are illustrated as follows:

PIS: …But I do not use them [computers]. I am too old and not willing to learn the new technology. I do have computer at home, but I do not use that for work.

RIT: I don't have a website. I have done it in the past. But unless you are connected, it is hard to keep update. I am the only person in the store and I have to deal with all kinds of things.

TCO/SPI: Yes, all my nephews will take care of that [inventory database] I don't need to know that. I am just sort of the speaker. They don't let me touch that since I will mess that up.

Among the four Native American owned micro-enterprises, the owner of PIS is not willing to accept the technology. The owner of RIT also believes that it is difficult to keep updating the website. According to the transcripts, it is also observed that the nature of micro-enterprises, i.e. employees fewer than five, could contribute to the lack of adoption of ICTs and the digital divide. Among the owners of PIS and TCO/SPI, age can also be a factor that leads to the personal inequality and thus lack of adoption of ICTs.

Economic Development

The following transcripts in this frame illustrate how the entrepreneurs felt that their businesses grow through their use of the technology:

RIT: I am paying the bills.

TCO/SPI: [The smartphone and desktop] Oh, yes. It helps us grow.

TCO: I do, it [Facebook] helped for my business grow so much for my optical business.

PIS: I make sales after monthly spiritual gatherings. I have done that couple of times before. This year was the first year I did commercials on TV. … And I did think that increases the sales. I am also in the yellow pages. .

As stated in the literature review, economic development can be viewed as the quantitative and qualitative improvement in the economy. It appears from the transcripts that all the Native American owned micro-enterprise benefit from the usage of ICTs. For example, by using the ICTs, the owner of RIT is able to survive. The economic development is also observed from TCO and SPI in terms of the growth and improvement. The ICTs also lead to the increase of the sales from PIS.

Direct effects

There is a strong link between the Native American owned micro-enterprises and the local communities. For example, RIT offers Native American embroidery courses for local community twice a week and is an avid social network user.

RIT: [Our] Facebook is more connected with the Native community. I have a big page and little page on Facebook, trying to keep up with things with different purposes.

PIS: I will also put promotion information on the Facebook. I have a list of products online.

As observed in the transcripts above, the social network provides foundations for better connection with local communities among the Native American micro-enterprise owners. As stated in the literature review, most Native societies tend to be collectivistic rather than individualistic, and entrepreneurialism is associated with the latter. Thus, the strong direct effects of ICTs among the Native American micro-enterprise owners could also be an important factor that could help explain the digital divide among them.

Empowerment

Although only 8% of the labels reflected this frame, the transcripts illustrate how the collectivistic Native American culture permeates the use of technology.

RIT: Yes, I post pictures and status. I give feedback when people asking questions about the store and the products. At least they know I have things they need. I you or your friend need them, I can post "hey, yes I have them".

PIS: Then after that I was so proud that I set up the account by myself. I put history information into the Facebook account.

TCO/SPI Yes, [taught myself] but till now I still use fingers to operate that [Computer]. It has to be easy to use. Fortunately my business partner is lawyer. She knows how to operate the computer.

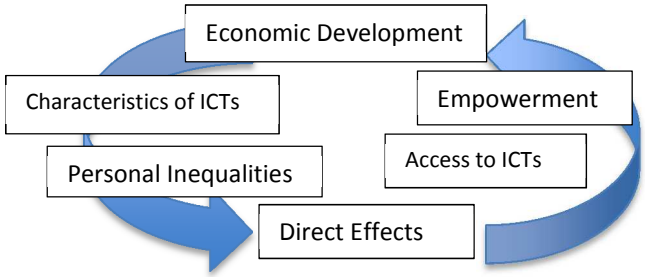
The above analysis illustrates, given simple access to internet and devices, that the characteristics of ICTs that enable Native American micro-entrepreneurs to grow and those that support social networking and simple usage.

It appears so far from the transcripts that the collectivistic nature of Native Americans is a critical factor during the adoption of ICTs. For example, RIT's customers mainly come from the local communities. The owner of PIS shares the history of the micro-enterprise on a Facebook account. And the owner of TCO and SPI receives additional support from family members. Among all of the Native American micro-enterprise we interviewed, the strong connection between the family, friends, and local communities is another important factor that would lead to the adoption of ICTs.

Implications for Micro-Enterprise Development

It seems from our analysis, the relative success of Native American micro-enterprises are associated not only with the adoption of technologies, but also the strong connections with the local communities. Thus, community engagement becomes a unique and critical factor that was not addressed in the previous model. As a tool of empowerment, the Native American owned micro-enterprises can reach the economic development. To answer the research question, the different levels of access to ICTs, Personal Inequality, and Direct Effects appear to be the key factors that lead to the adoption of technology. Native American owned micro-entrepreneurs are empowered through their ability to learn to use the ICTs themselves and together with members of their family and community. We identify relationships between these frames that are illustrated as follows:

Figure 2: Cyclical relationship between factors that influence Native American micro-entrepreneurs' adoption of technology



The ICTs pose opportunities for businesses yet their unique characteristics highlight personal inequalities that need to be overcome before the Native American micro-enterprises are able to achieve the direct effects they desire when accessing the ICTs. The direct effects of accessing ICTs lead to empowerment mainly through micro-entrepreneurs' learning to use the technologies to grow their businesses. As found in the above analysis, all the micro-entrepreneurs in our sample experienced business growth through their adoption of technology. Two of the businesses were re-investing profits to purchase and use more ICTs to support this growth – hence bringing about a positive growth cycle for the business.

Conclusion and Future Research

Our analysis of four Native American owned micro-enterprises, identifies the key factors that influence Native American micro-entrepreneurs' adoption of technology. Social community support was seen to be essential in enabling the micro-entrepreneurs to overcome their personal inequalities associated with the characteristics of the ICTs. We identify a positive cyclical relationship between these factors that supports the growth of these micro-enterprises. Additional micro-enterprises will be studied to achieve greater in-depth understanding of the relationships among these factors.

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