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A Systematic Literature Review on Immigrants' Motivation for ICT Adoption and Use

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ABSTRACT

Several studies demonstrate that immigrants use computers and the Internet more than non-immigrants or earlier immigrants. What motivates immigrants to use information and communication technology (ICT)? What are the factors that influence immigrants' ICT behaviors? For this study, the author chose 20 peer-reviewed articles published between 2001 and 2015 to study immigrants' motivations for ICT adoption and use. The following article will discuss two motives for immigrants' ICT use, as well as identify seven factors influencing adoption, non-adoption, use, and non-use.

KEYWORDS

Digital Divide, Immigrant, Influence Factors, Information and Communication Technology, Motivation, Systematic Literature Review, Technology Adoption Model, Theory of Reasoned Action

INTRODUCTION

The Merriam-Webster dictionary defines immigration as: "Entering and usually becoming established ... to come into a country of which one is not a native for permanent residence." This type of movement—often to a more developed country—has become a global phenomenon. There are several socio-economic and socio-political reasons to migrate from a home country to a host country. These include poverty, unemployment, conflicts, threats, and political captivity. However, leaving a community known since birth and adjusting to a new environment can be challenging

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for immigrants. On one hand, immigrants feel disconnected and isolated from the friends and family that they have left behind. On the other hand, there is a lack of strong networks with people in their new community. Restricted communication by a limited knowledge of the host country's language may cause feelings of loss.

Several studies assessing immigrants' struggles in adjusting to the host country's environment have identified that ICTs—mainly computers and the internet—play pivotal roles in the successful resettlement of immigrants. By using ICTs, immigrants can:

- Reconnect and maintain sociocultural networks back home (Bacigalupe & Càmara, 2012; Benitez, 2006; Chen, 2010)
- Familiarize themselves with and adjust to a new environment (Benitez, 2006; Kabbar & Crump, 2006; Khvorostianov, Elias, & Nimrod, 2011)
- Explore information and provide various support services (Alam & Imran, 2015; Barth & Veit, 2011; Peeters & d'Haenens, 2005)
- Retrieve health information (Bacigalupe, & Càmara, 2012; Mikal, & Woodfield, 2015; Selsky, Luta, Noone, Huerta, & Mandelblatt, 2013)
- Enhance children's education (Kabbar, & Crump, 2006, 2007; Tripp, 2010)
- Entertain elderly people in their leisure time (Khvorostianov et al., 2011)

Studies have noticed different purposes of ICT adoption and use by immigrants in different parts of the world.

Several studies indicate that limited income, low-level education, lack of skills, and language barriers cause recent immigrants to have lower rates of access to computers and the internet than the locals (Barth & Veit, 2011; Chen, 2010; Haight, Quan-Haase, & Corbett, 2014; Kabbar & Crump, 2006; Mossberger, Tolbert, Bowen, & Jimenez, 2012; Tsai, 2006). Ahmed and Veronis (2016), Haight et al. (2014), and Ros (2010) noted that recent immigrants are more likely to suffer from the digital divide – the gap between/ among people in regards to their access, skills, usage of and motivation to computers and the Internet (Heisler, 2008; Nguyen, 2012; Sparks, 2013; Van Dijk, 2012). When they do have access to the Internet, they have higher levels of online activities and interactions. Similarly, Kabbar and Crump (2006, 2007) noted that immigrants view ICTs, particularly the computer and the Internet, positively and want to use them as soon as they have the opportunity. Other scholars, such as Mossberger et al. (2012), argue that some immigrants consciously choose not to adopt and use ICT devices because they fear technological risks or have negative feelings about technology. Different findings lead to important questions, such as: What motivates immigrants to use (or not use) ICTs? What factors influence immigrants' decisions to adopt ICTs?

Immigrants have unique socio-cultural backgrounds. Therefore, they may have different perceptions in regards to ICT adoption and use. Identifying immigrants'

motivations to adopt ICTs, as well as the factors that influence immigrants' decisions with respect to ICT adoption, is important for a smooth transition and successful integration of immigrants into a host country. Countries including Australia, Canada, Germany, the United Kingdom, and the United States welcome millions of immigrants each year. It is important to understand global trends influencing immigrants' use or non-use of ICTs. The following section will review literature on diaspora communication, technology adoption patterns of immigrants, and challenges created by the digital divide.

LITERATURE REVIEW

Diasporic communication is communication behavior of immigrants within their communities, with their family members in their country of origin, and with other communities in the host country or beyond (Benitez, 2006). The digital divide is a disparity between people in terms of computer and Internet access, skills and knowledge, affordability of ICT devices and services, language, and other factors (van Dijk, 2012). Technology adoption is the acceptance and appropriation of any technological device by users based on the device's usefulness and simplicity in use (Davis, Bagozzi, & Warshaw, 1989).

Diaspora Communication

The flow of international migration forms a multicultural society in the host country, establishes a network of communication across national spaces, and enriches a distinct diaspora (Benitez, 2006). Frequent communication, which is crucial for diasporas, is made possible by using various ICT devices. In addition to computers and the Internet, social media applications—including Facebook, Viber, and Skype—make international communication accessible and affordable. They also transform traditional communication into lively virtual meetings between transnational families using text, symbols, and audio-visual apparatus for regular contact and day-to-day information sharing.

Virtual relationships between transnational members have fostered a new sense of community called the “digital diaspora.” The digital diaspora is an electronic community of immigrants living in different locations who interact through ICTs (Brinkerhoff, 2009; Everett, 2009). Suitable for connecting diaspora around the world, ICT devices provide a forum for sharing information, exchanging ideas, and building virtual communities through social media platforms (Brinkerhoff, 2009; Everett, 2009).

Some research scholars worry about the mental health effects of long-term separation from family/community members in an immigrant's country of origin. Bacigalupe and Cámara (2012, p. 1426) noted that “grief and loss resulting in stress, trauma, depression, and other symptoms are often the themes associated with a clinical view of immigration.” There are two prevalent aspects of the psychological construct. The first is a grief over the separation from the community and family members in the country of origin. The second is a loss of identity in the host country and stress

created by acculturation in a new society. With the emergence of ICTs into the lives of immigrant families, mental health effects have become more favorable (Bacigalupe & Cámara, 2012). ICTs reconnect loved ones despite geographic distance and play a catalytic role in alleviating mental stress and psychological trauma in immigrants.

Immigrants may not be able to return home to meet family and community members for reasons including: cost, legal status, and security. The Internet and social media can unite immigrants who are living in different countries. Scholars have noted that the opportunities created by the Internet and social media have created and shaped the identity of virtual diaspora (Brinkerhoff, 2009; Everett, 2009). Hence, the virtual world has played a significant role in creating and reforming diaspora communications. Yet, immigrants face two major difficulties with respect to communicating virtually with people from their country of origin: (1) a digital divide (in the form of access, affordability, skills, or perception) among immigrants and/or their loved ones in the country of origin; and (2) immigrants' reluctance to adopt technology.

Digital Divide

The concept of the digital divide denotes the gap between people with respect to their access to, skills in, usage of, and motivation to use computers and the Internet. The digital divide occurs when there is a disparity between people for their (in)ability to use ICT devices (computers and the Internet) because of several indicators, such as age, education, employment, and income (Compaine, 2001; Norris, 2001; van Dijk, 2012).

This concept has been evolving and expanding since it was first popularized in the mid-1990s. Early studies on the digital divide focused on access and interpreted the concept as an unequal access of people to computers and the Internet (Compaine, 2001; Norris, 2001). When ICT devices became more affordable and widely accessible, the digital divide continued in another form: disparity of skills among people with respect to using these devices (Dewan & Riggins, 2005). Studies from the early 21st century extended the concept of the digital divide to a second level and included gaps in skills and knowledge. A few years later, scholars such as Dewan and Riggins (2005) and van Dijk (2012) argued that the digital divide should be assessed based on usage of computers and the Internet regardless if these devices brought positive change to users' livelihoods. Hence, a third layer was created: the digital usage/outcome divide. This level focuses on the inequality of users' capacities to exploit ICT devices for productive purposes.

During the second decade of the 21st century, the concept of the digital divide extended to a new connection between socio-cultural and psychological spheres. Scholars assumed that ICT infrastructure is one of several factors affecting the extent of the digital divide (Compaine, 2001; Norris, 2001). Therefore, they argued that socio-cultural and psychological aspects (i.e., attitude toward technology, anxiety, or technophobia) were important to motivate people to use or not use ICT devices (Compaine, 2001; Norris, 2001). Access to ICTs is more of a culturally informed decision than the outcome of socio-economic disparities (van Dijk, 2012). The digital

divide may never be bridged without addressing socio-cultural factors pivotal to technology adoption in many societies (Haight et al., 2014; van Dijk, 2012).

Technology Adoption

Technology adoption has profound effects on the daily activities of individual users, organizations, and society. Potential users adopt new technology with various assumptions, including affordability, cost-effectiveness, ease of use, and usefulness. Several models assess and analyze a user's technology adoption practices. This article offers a brief overview of the technology adoption model (TAM) because several of the articles selected for this study used TAM to analyze immigrants' motivations for technology adoption.

TAM is one of the most popular and most frequently employed research models used to study users' behaviors toward the adoption of technology. Based on the theory of reasoned action, this model describes how a user's attitude motivates his/her behavior toward technology (for example, computer use). TAM is popular for at least three reasons: (1) it has a strong foundation in psychological theory; (2) it can be used as a guideline to develop a successful information system; and (3) the model is widely applicable across time, setting, populations, and technologies (Liao, Palvia, & Chen, 2009).

TAM, developed by Davis, has been widely discussed and tested by different research scholars to examine individual perceptions with regards to technology acceptance behavior (Davis et al., 1989). "Perceived usefulness" and "perceived ease of use" are two key factors in this model. It is relevant for studying users' perceptions of adopting (or not adopting) ICT devices. Perceived usefulness is defined as the prospective user's subjective probability that using a specific ICT can enhance his/her everyday performance (Davis et al., 1989). Similarly, perceived ease of use refers to a prospective user's belief that a new technology should be easy to use without any significant effort. Although these two factors are significant predictors in technology adoption of any kind, external variables can influence these factors, including: social (education, language, skills); cultural (attitude, perception, psychology); and political (legal requirements) (Davis et al., 1989). Although scholars attempted to extend and enhance the explanatory and predictive power of TAM in different contexts, TAM continues to be widely used due to its parsimony and replicability (Liao et al., 2009).

Different studies reviewed in this section have demonstrated two significant challenges for effective diasporic communications: (1) the digital divide (affordability and capability to adopt ICTs); and (2) immigrants' attitudes toward technology adoption. Moreover, researchers (such as Barth & Veit, 2011; Haight et al., 2014) identified that immigrants have limited opportunities to access ICT devices compared to their local counterparts. Yet, they have positive attitudes with respect to technology adoption and, with access to ICTs, are more interactive online. Due to the lack of longitudinal assessment of past research, there is limited understanding about what motivates immigrants to use ICT devices and what factors influence their motivation.

This study, therefore, is designed to assess past studies on immigrants' motivations with respect to ICT adoption and factors influencing immigrants' motivations to use ICT devices.

RESEARCH METHODOLOGY

By employing Okoli and Schabram's (2010) systematic literature review (SLR) method, this study aims to assess the most relevant literature with regards to the following research question: What motivates immigrants to use or not use ICT devices? SLR is a "systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners" (Okoli & Schabram, 2010, p. 4). In other words, SLR helps to identify the most appropriate scholarly literature related to specific research questions, assess the quality of the literature, synthesize the findings in a systematic way, and identify the gaps that may require further research. Okoli and Schabram's (2010) model, one of the most comprehensive research methods, proposes eight steps to conducting an SLR: (1) determine the purpose of the review; (2) adhere to protocol and undergo training; (3) search for the literature; (4) screen for practicality; (5) perform quality appraisal; (6) extract data; (7) synthesize studies; and (8) write the review.

Using various research methods over the past 15 years, several global studies were conducted on the use of Internet and/or ICTs by immigrants. This included refugee immigrants. However, there are no scholarly articles to substantially and systematically assess the trends in immigrants' motivation or demotivation to use ICTs. The current study, therefore, will be relevant in assessing the trends in immigrants' motivations to use or not use the Internet and/or ICT devices. Often referred to as a "stand-alone literature review," a SLR can stand on its own as a complete research project and can be a paradigm shifter because of its scope and rigor (Okoli & Schabram, 2010).

Data Collection and Analysis

In consultation with two librarians at the University of Ottawa specializing in communication and e-business, seven databases were identified and searched. These databases were ABI/INFORM Global, ACM Digital, Communication Source, ProQuest, Scholars' Portal, Scopus, and Web of Science. The keywords or phrases used to search an online database at the University of Ottawa (<https://biblio.uottawa.ca/en/databases>) were immigrant* OR newcomer* AND motiv* and "motivation factor*" OR adopt* AND Internet OR ICT* OR "communication technolog*". Due to the 15-year publication period, thousands of articles were identified, making this research project very intractable and complex. Several limiters (such as English language, peer-reviewed, scholarly journals, articles, and full text) were used to make the SLR practical, manageable, and relevant to the research topic (see Table 1). Despite these limiters, 8,301 articles were retrieved through the ProQuest database. With a high number of articles found in ProQuest, a keyword search was limited to the abstracts.

Table 1. Criteria for article selection

Database (Number of Articles)	Boolean/Phrase Used	Published Date Range	Journal Type	Article Type	Language
ABI/INFORM Global (4) ACM Digital (7) Communication Source (7) ProQuest (ab*69) Scholars Portal (15) Scopus (18) Web of Science (14)	immigrant* OR newcomer* AND motiv* and “motivation factor*” OR adopt* AND Internet OR ICT* OR “communication technolog*”	2001 to 2015	Scholarly article	Peer- reviewed Full text	English

Sixty-nine results were generated. Altogether, 134 articles were retrieved. Twenty-five of the articles were deleted due to repetition.

Among the remaining 109 articles, abstracts and keywords were carefully reviewed and rated on a Likert Scale (1 = least relevant to the research topic, 5 = most relevant to the research topic). Thirty-seven articles rated 4 or 5 were selected for quality appraisal, which is the fifth stage of a systematic literature review (Okoli & Schabram, 2010). In this stage, the main parts of the articles (for example, introduction, research questions, and discussion/conclusion sections) were read to make sure that the articles were highly relevant to the research topic. Finally, 20 articles were selected for final review (see Table 2 for the selected articles).

Before starting data extraction, contacting thematic experts “to receive an assessment of the completeness of the search” is recommended to ensure whether relevant articles were missed during the selection process (Okoli & Schabram, 2010, p. 20). For this purpose, the author contacted Professor Daniel J. Paré of the University of Ottawa with a description of the research project and a list of the selected articles. Professor Paré suggested that the author look at two specific books and various articles to gain background. He also noted that these publications would be relevant for the literature review and data analysis. No additional articles were incorporated into the study.

As seen in Figure 1, data that answers the research question would be extracted systematically from each article. The data would be coded into small thematic units; meaningful connections between these units would be explored by developing a thematic layout. In other words, collected data would be organized into themes and links between the themes would be explored to make comprehensive sense of the themes. Finally, the SLR would conclude with a description of novel findings.

FINDINGS

General Overview

To assess immigrants’ ICT adoption and use, the selected articles for this study (Table 2) covered a range of geography, diverse ethnicity, multiple languages, and various

Table 2. Articles selected for this study

Articles	Coverage	Study Subjects	Research Method	Key Findings/Arguments
Alam & Imran (2015)	Queensland, Australia	Refugee migrants	Focus groups, (n=28)	Examines factors influencing refugee migrants' adoption of ICT and its relevance to their social inclusion
Bacigalupe & Cámara (2012)	Global	Psychological patients of immigration background	Literature review	Argues that ICTs may influence and mainstream transnational experiences
Bacigalupe & Lambe (2011)	Global	Immigrant/transnational families	Literature review	Investigates the potential impact of ICTs on the lives of transnational families and how these families utilize them
Barth & Veit (2011)	Germany	Immigrants	Case study [semi-structured interview (n=28)]	Analyzes the influence of migration background on the capability to use public e-services
Baycan, Sahin, & Nijkamp (2012)	Amsterdam, The Netherlands	Turkish entrepreneurs in The Netherlands	Multivariate qualitative classification method (in-depth interviews)	Addresses motivations of second generation Turkish immigrants for socio-economic emancipation
Benitez (2006)	Washington D.C., U.S.	Salvadoran immigrants	Ethnography [in-depth interviews, (n=67), participant observation]	Identifies how transmigrants and immigrant communities appropriate and make use of the ICTs based on various influence factors
Chen (2010)	Singapore	Chinese immigrants	Telephone survey (n=710)	Argues that immigrants who frequently communicate with locals via the Internet are more adaptive in terms of overall sociocultural adaptation
Haight et al. (2014)	Canada	Canadian residents including immigrants	Meta-analysis based on the Canadian Internet Use Survey-2010	Finds that recent immigrants who are online have significantly higher levels of online activity than Canadian-born residents and earlier immigrants
Kabbar & Crump (2006)	Wellington, New Zealand	Refugee immigrants from Asia and Africa	Semi-structured interviews (n=32)	Identifies factors influencing ICT adoption/non-adoption by immigrants (such as literacy, language skill, and cultural background)
Kabbar & Crump (2007)	New Zealand, Wellington	Refugee immigrants from Asia and Africa	In-depth interview (n=32)	Finds that the most common factor in ICT adoption for immigrants who were new to computing was via friends and family
Khvorostianov et al., (2011)	Israel	Older Jewish immigrants from the Former Soviet Union in Israel	In-depth interviews (n=32)	finds that old immigrants in Israel use ICTs for managing health, nurturing professional interests, extending social networks, and enjoying leisure.

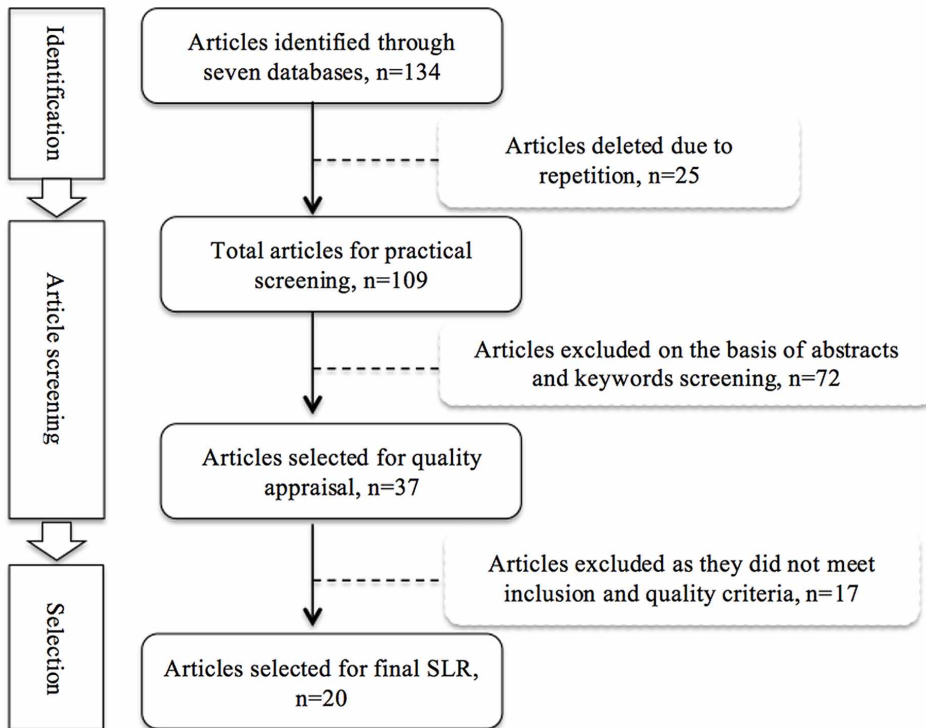
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Table 2. Continued

Articles	Coverage	Study Subjects	Research Method	Key Findings/Arguments
Mesch (2012)	Israel	Internet users (minorities and immigrants)	Online survey	Finds that disadvantaged groups show greater motivation to use ICTs to expand business and occupational contacts
Mikal & Woodfield (2015)	U.S.	Iraqi and Sudanese Refugee immigrants	Five focus groups (n=25)	Observes four trends of refugee immigrants' ICT use: (1) Internet use was related to culture of origin; (2) refugees were reluctant to explore online; (3) children served as brokers of online knowledge; and (4) limited Internet access
Mossberger et al. (2012)	Chicago, U.S.	Latino immigrants	Telephone survey (n=3,453)	Interprets neighborhood and individual factors influencing ICT adoption and use
Peeters & d'Haenens (2005)	The Netherlands	Ethnic minorities (Turkish, Moroccan, Surinamese, & Antillean)	Face-to-face interview (n=1913)	Analyzes immigrants' ICT adoption and use in two terms: (1) bonding and (2) bridging Argues that ICT communication slants toward country of origin
Selsky et al. (2013)	Washington D.C., U.S.	Latino immigrants (<i>attending safety-net clinics in the U.S.</i>)	Survey questionnaire (n=1,273)	Investigates access to and intended use of the Internet for cancer information among low income, immigrant Latinos
Spaiser (2013)	Germany	Turkish and East European immigrants in Germany	Survey (n=2,082)	Explores young immigrants' online political activities based on the sociological rational-choice theory and theoretical resource models
Tripp (2010)	Los Angeles, U.S.	First generation Latino immigrants in the U.S.	Participant observations and in-depth interviews	Analyzes how Latino immigrants in the U.S. negotiated and debated home access to the internet, as well as how they regulated children's use of the internet
Tsai (2006)	U.S.	Taiwanese immigrants in the U.S.	Ethnography (semi-structured interview and set of questionnaire)	Assesses how new computer technology promotes immigrant families' adaptation and alleviates stress associated with resettlement
Zaidi, Fernando, & Ammar (2015)	Canada	Women, who are victims of IPV	Semi-structured interview (n=49)	Argues that ICTs can be both a tool of empowerment, and liberation or can involve harassment, threats, and victimization

methodologies. Six studies discussed the issues of immigrants in the U.S. Ten studies (two from each country) focused on immigrants in New Zealand, Israel, Canada, Germany, and The Netherlands. Two studies (one from each country) examined immigrants' ICT adoption in Australia and Singapore. The two remaining articles

Figure 1. SLR flow diagram



were based on literature review. These articles demonstrated a trend that immigrants from developing countries (i.e., South America, Africa, and Asia) resided in developed countries in North America (U.S. and Canada), West Europe (Germany and The Netherlands), and Australia (Australia and New Zealand). Interestingly, two small but developed Asian nations (Israel and Singapore) were also among the countries that received immigrants.

Of the 20 articles, 17 were empirical studies. The three remaining performed meta-analysis on immigrants' adjustment to their new environment, as well as their use of ICTs to facilitate their transition. Among the empirical studies: five used semi-structured interviews; five used survey methods; three used ethnographic studies; two used focus groups; and two used in-depth interviews. Of the three meta-analyses, two studies were based on literature review and one study used data from the Canadian Internet Use Survey-2010. Four articles were published in 2012, three articles were published each year in 2015, 2011, and 2006. Two articles were published each year in 2013 and 2010. Three articles were published each year in 2014, 2007, and 2005. These articles covered various subjects with respect to immigrants' motivation, adoption, and use of ICTs. Fourteen studies looked at first generation immigrants, two studies looked at second generation immigrants, two studies looked at parent-child relationships, one study looked at elderly immigrants, and one study looked at refugee women (see Table 2).

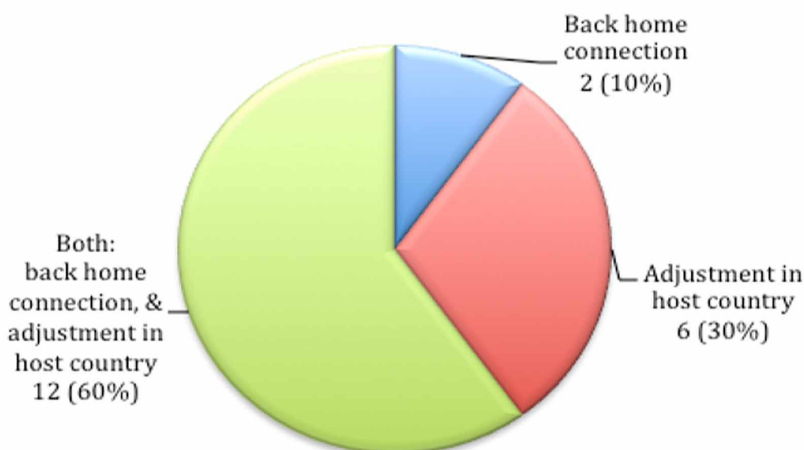
Immigrants' Motivations for ICT Use

Scholars found that immigrants show greater motivation to adopt and use ICTs for the following reasons: familiarizing themselves with their new environment; connecting with family and friends in their country of origin; getting information updates; performing job searches; enhancing children's education; and spending leisure time in old age (Haight et al., 2014; Mesch, 2012). Most of the articles focused on two points often referred to as "bonding" and "bridging" (Peeters & d'Haenens, 2005). Bonding refers to immigrants' frequent contact with family and friends in their country of origin. Bridging refers to immigrants' desires to integrate into and familiarize themselves with the host country. Twelve of the 20 studies discussed the use of ICTs by immigrants for both home connection and adjustment in the host country. Six studies focused on immigrants' endeavours to familiarize themselves with and adjust to the host country. Two studies prioritized immigrants' connection with family and friends back home as the major purpose of ICT adoption and use (see Figure 2).

ICTs for Home Connection

Immigrants may face a series of pre- and post-migration stresses related to family separation and settlement in a new environment (Mikal & Woodfield, 2015; Tsai, 2006). They worry about careers, job opportunities, financial status, social connections, and reputation. Fourteen of the studies identified and discussed the importance of ICTs in coping with and overcoming these challenges by making a connection with people back home. A key theme of these studies was that the mainstreaming of ICTs increasingly allowed immigrant families to maintain social ties across national borders despite vast geographic distances (see Bacigalupe & Càmara, 2012; Bacigalupe & Lambe, 2011; Benitez, 2006; Chen, 2010; Mesch, 2012).

Figure 2. Motivation of ICT adoption



Immigrants encounter various challenges related to their adjustment in their new environment. These include language problems, lack of jobs, and disconnection from society. Consequently, they may feel socially isolated and residentially segregated from their new community (Tsai, 2006). ICTs provide platforms for immigrants to maintain existing relationships with people back home in order “to compensate for their lack of social capital” in their host country (Mesch, 2012, p. 317). Bacigalupe and Lambe (2011, p. 14) noted that ICTs may “fill a relational, emotional, and social void for [immigrant] families who have more than one country as their home.” ICTs can provide true connection between immigrants’ families and friends and can foster positive effects in immigrants’ psychosocial experiences (Bacigalupe & Càmara, 2012). Similarly, ICTs can provide a source of “emotional sustenance,” create “a feeling of collective familyhood,” and maintain relationships despite geographic distances (Bacigalupe & Càmara, 2012, p. 1431). Since ICTs provide a way of strengthening the connection between immigrants and people in the home country, their utilization among immigrants is increasing (Bacigalupe & Lambe, 2011; Benitez, 2006; Chen, 2010).

Scholars have identified several patterns used by immigrants when communicating via ICTs (Chen, 2010; Haight et al., 2014; Mesch, 2012; Peeters & d’Haenens, 2005). Mesch (2012) pointed out that non-immigrants and earlier immigrants (who are financially settled) used ICTs to maintain existing social ties in the host countries. Recent immigrants used ICTs to connect with their social circle back home and overcome existing physical and psychological barriers (Mesch, 2012). Similarly, Haight et al. (2014) found that recent immigrants to Canada were less likely to have Internet access. However, if they did have access, they had a higher level of online interactions with family and friends back home than they did with people in Canada. Peeters and d’Haenens (2005) noted that recent immigrants’ communication via the Internet usually slanted toward the country of origin. Their study identified that Turkish immigrants in The Netherlands were more interested in accessing home country media through the Internet (2005). Chen’s (2010) study on Chinese immigrants in Singapore revealed two findings as immigrants lived for longer periods of time in the host country: (1) they were more likely to surf the host country’s websites; and (2) they were less likely to surf websites of their country of origin. Similarly, these immigrants were more likely to use the official language of the host country and less likely to use their mother language during online interactions (Chen, 2010). Furthermore, Benitez (2006) and Haight et al. (2014) identified that the migratory status of immigrants shaped their appropriation, adoption, and usage of ICTs. In the U.S., Salvadoran immigrants who had temporary legal status and could not go back to Salvador because of a lack of legal documents were found frequently communicating via ICTs with their family and friends who were still in Salvador (Benitez, 2006). Hence, back home connection was one of immigrants’ key motives for ICT adoption. This connection reduced stress, mitigated their sense of loss, and relieved homesickness.

ICTs for Adjustment and Integration

Eighteen of the articles identified adjustment and integration in the host country as the most important motivations for immigrants' use of ICTs. For instance, refugee immigrants in Australia (Alam & Imran, 2015) and Taiwanese immigrants in Washington, D.C. (Tsai, 2006) used computers and the Internet to participate in and to integrate into their new environment. Arab immigrants in Israel used ICTs to expand their social circle and overcome social isolation in the host country (Mesch, 2012). Refugees from Iraq and Sudan who immigrated to the U.S. used ICTs to overcome post-migration stress and re-establish "their lives, relationships, and identities in a new and unfamiliar context" (Mikal & Woodfield, 2015, p. 1319). A group of Latino immigrants in Chicago used the Internet in their homes to adjust to the neighborhood in which most of the residents were digitally connected (Mossberger et al., 2012). Another group of Latino immigrants in Washington, D.C. adopted ICTs to retrieve health information because they trusted the Internet more than other information sources (Selsky et al., 2013). Similarly, Salvadoran immigrants in the U.S. used ICTs to establish and sustain ethnic and sociocultural networks that provided them with sociability, support, new opportunities, and a sense of belonging (Benitez, 2006). Turkish and East European immigrants in Germany used computers and the Internet for empowerment purposes (such as political participation) in their new home country (Spaiser, 2013). Moroccan immigrants in The Netherlands used the Internet to integrate with the local community through online discussion groups (Peeters & d'Haenens, 2005). In addition, some immigrants adopted and used ICTs to help their children adjust and integrate themselves into the new country. For instance, Asian and African immigrants in New Zealand (Kabbar & Crump, 2007) and a group of Latino immigrants in Los Angeles (Tripp, 2010) used computers and the Internet to enhance their children's education and allow them to fit into the host country's competitive environment. As discussed, most of the selected studies demonstrated that the key motivation for ICT adoption and use was to adjust to and integrate within the host country's environment.

Immigrants' psychological factors (such as attitude, stress, isolation, and confidence) were equally important with respect to ICT adoption and use (Chen, 2010; Khvorostianov et al., 2011). Tsai (2006) contended that ICT devices provided immigrants with new opportunities and strategies to overcome psychological consequences, including stress created by resettlement and social isolation. Khvorostianov et al. (2011) found that older immigrants from the former Soviet Union who resided in Israel used ICTs to cope with cultural isolation, depression, the host country's language, poverty, and ageing. These immigrants believed that ICTs enhanced their sense of independence, built positive attitudes toward ageing, and initiated "a process of empowerment" (Khvorostianov et al., 2011, p. 3). Chen (2010, p. 388) observed that "immigrants who are more active in interpersonal communication are better adjusted psychologically and physically" to the host country. These immigrants were more likely to communicate with local people via the Internet while using the host country's language (Chen, 2010).

However, the adoption and use of ICTs is not free of challenges. Mesch (2012) warned that the increased use of ICTs may foster social alienation and residential segregation of immigrants in specific contexts. Several immigrants in the selected studies were found to be alienated in the host country: former Soviet Union immigrants in Israel (Khvorostianov et al., 2011); Chinese immigrants in Singapore (Chen, 2010); and young Turkish immigrants in The Netherlands (Peeters & d'Haenens, 2005). Alienation of immigrants to the host country may cause a long and complex integration process. In addition, some immigrants worried that ICT usage will allow their children to come across inappropriate content and have contact with strangers (Kabbar & Crump, 2006; Tripp, 2010). These immigrants believed that “not everything is useful in the Internet” (Kabbar & Crump, 2006, p. 116) and that the Internet is “a gateway to harms” (Tripp, 2010, p. 558). These immigrants felt that it was important to monitor their children’s online activities in accordance with their cultural, religious, and social norms that may be challenged by adopting ICTs (Kabbar & Crump, 2006; Tripp, 2010). On one hand, various opportunities motivated immigrants to use ICTs. On the other hand, challenges demotivated immigrants to use ICTs due to various influential factors.

Influence Factors of Immigrants’ Motivation

Authors of the selected articles identified several factors influencing immigrants’ motivation to adopt ICTs. The most common factors included age, culture, education, income, language, ICT skills, and attitude. These factors are described below.

- **Age:** Based on the results of original articles that are reviewed for this study, thirteen of them found an association between age of immigrants and their individual decision- making in regards to ICT adoption (see, Bacigalupe & Lambe, 2011; Barth & Veit, 2011; Baycan et al., 2012; Benitez, 2006; Chen, 2010; Haight et al., 2014; Kabbar & Crump, 2006, 2007; Peeters & d’Haenens, 2005; Spaiser, 2013; Tripp, 2010; Tsai, 2006; Zaidi et al., 2015). For instance, a young person was highly likely to adopt and use ICTs in comparison with his/her older counterparts. In Tripp’s (2010) study, all teen participants expressed confidence and familiarity in using computers and the Internet. However, their parents had limited knowledge about handling ICTs. When it became difficult for parents to monitor their children’s online activities, parents were less likely to adopt ICTs (Tripp, 2010). Therefore, older individuals cannot take advantage of the potential for bonding offered by the Internet (Barth & Veit, 2011; Peeters & d’Haenens, 2005).
- **Culture:** Ten of the selected studies noted that immigrants’ cultural backgrounds in the country of origin and the contemporary culture in the host country influenced their decisions about ICT adoption (see, Alam & Imran, 2015; Barth & Veit, 2011; Chen, 2010; Haight et al., 2014; Kabbar & Crump, 2006, Khvorostianov et al., 2011; Mikal & Woodfield, 2015; Peeters & d’Haenens, 2005; Tsai, 2006; Zaidi et al., 2015). Some immigrants used ICTs to bridge cultural gaps (Mikal & Woodfield,

2015; Peeters & d’Haenens, 2005) and engage in the contemporary culture of the host country (Khvorostianov et al., 2011; Tsai, 2006). Other immigrants refrained from ICT use because they felt that “Internet content conflicted with their cultural and social norms” (Kabbar & Crump, 2006, p. 116). In some cultures, female members are not allowed to or do not feel comfortable using computers and the Internet outside of the home and/or in public places (Kabbar & Crump, 2006).

- **Education:** Ten of the articles selected for this study highlighted that highly educated immigrants who want to receive an education in the host country are more likely to adopt ICTs compared to their counterparts with medium or low education (see, Alam & Imran, 2015; Bacigalupe & Lambe, 2011; Baycan et al., 2012; Benitez, 2006; Chen, 2010; Kabbar & Crump, 2007; Khvorostianov et al., 2011; Mesch, 2012; Selsky et al., 2013; Tripp, 2010). Baycan et al. (2012, p. 985) maintained that “educational attainment ... appears as decisive factor toward orientation to the ICT sector.” Some Latin American parents purchased computers to assist children with school assignments. However, they were hesitant to adopt these ICTs because of the risks associated with the devices (Benitez, 2006; Tripp, 2010). In New Zealand, Asian immigrants who had relatively higher educational backgrounds were found to be more likely to adopt and frequently use ICTs (Kabbar & Crump, 2007).
- **Income:** Ten of the selected studies (see, Barth & Veit, 2011; Benitez, 2006; Kabbar & Crump, 2006; Haight et al., 2014; Mesch, 2012; Mossberger et al., 2012; Selsky et al., 2013; Tripp, 2010; Tsai, 2006; Zaidi et al., 2015) found that income positively influenced immigrants in ICT adoption and use. According to these studies, immigrants with more economic capital, professional jobs, or satisfactory employment used the Internet to maintain sociocultural networks. Limited or inconsistent income, however, caused immigrants to refrain from adopting ICTs. Barth and Veit (2011), for instance, identified low income as one of three characteristics of immigrants. The other two characteristics were cultural differences and lack of language ability of the host country. Income status directly affected ICT use because of costs associated with hardware, software, service, maintenance, and training (Mossberger et al., 2012).
- **Language:** Eleven of the selected articles considered language as a significant factor influencing immigrants’ decisions to adopt and use ICTs (see, Barth & Veit, 2011; Benitez, 2006; Chen, 2010; Kabbar & Crump, 2006, 2007; Mikal & Woodfield, 2015; Mossberger et al., 2012; Peeters & d’Haenens, 2005; Selsky et al., 2013; Tripp, 2010; Tsai, 2006). Learning the language and norms of the host country is a part of resettlement; it is a way to rebuild immigrants’ social images of themselves (Barth & Veit, 2011; Tsai, 2006). Without proficient knowledge of the host country’s language, immigrants face difficulties in carrying out tasks, exploring job opportunities, and building social ties with local community members (Benitez, 2006; Chen, 2010; Kabbar & Crump, 2006). Having a limited language proficiency in the host country’s language negatively influenced immigrants’ decisions with respect to ICT adoption (Mikal & Woodfield, 2015; Tripp, 2010; Tsai, 2006).

- **ICT Skills:** Twelve of the selected articles recognized ICT handling skills as an important factor influencing immigrants' motivation to adopt ICTs (see, Alam & Imran, 2015; Bacigalupe & Cámara, 2012; Bacigalupe & Lambe, 2011; Barth & Veit, 2011; Baycan et al., 2012; Benitez, 2006; Chen, 2010; Haight et al., 2014; Kabbar & Crump, 2006, 2007; Khvorostianov et al., 2011; Mossberger et al., 2012; Peeters & d'Haenens, 2005). According to these articles, immigrants perceived ICTs as innovative tools that provided them with advantages for successful post-migration settlement. Skills and usage related to the digital divide, however, appeared as major barriers to immigrants in adopting ICTs. Some scholars (such as Barth & Veit, 2011; Tsai, 2006) found that immigrants were consequently motivated to use ICTs for simple activities; they avoided partaking in professional activities because of their lack of or limited knowledge and skills with respect to handling ICTs. Immigrant parents felt uncomfortable about adopting ICTs because of potential risks to their children (Tripp, 2010).
- **Attitude:** A positive attitude toward technology is found an important factor in influencing ICT adoption. Six of the selected articles demonstrated that individuals' perceptions and attitudes influenced their motivation with respect to ICT adoption (see, Chen, 2010; Kabbar & Crump, 2006, 2007; Mossberger et al., 2012; Peeters & d'Haenens, 2005; Tripp, 2010). Lack of confidence, technological anxiety, privacy concerns, and fear of unintended consequences of ICT use may negatively influence people with respect to ICT adoption and use (Mossberger et al., 2012). Similarly, some cultures do not permit female immigrants to use computers and the Internet outside of the home and/or in public places, including the host country (Kabbar & Crump, 2006, 2007). As detailed above, some immigrants consciously choose not to adopt ICTs for cultural or psychological reasons.

To conclude this section, ICT adoption is important for two fundamental reasons: (a) connecting with family and friends in the country of origin and (b) successfully adapting and socializing in the host country (Alam & Imran, 2015; Benitez, 2006; Peeters & d'Haenens, 2005; Selsky et al., 2013; Spaiser, 2013; Tsai, 2006). Moreover, the selected articles identified seven factors influencing immigrants' motivation to adopt and use ICTs. These included age, culture, education, income, language, ICT skills, and attitude. The following section will discuss and analyze the findings.

DISCUSSION AND CONCLUSION

Migration is a global phenomenon. Every year, millions of people migrate as immigrants from their countries of origin to other countries in search of better opportunities and higher levels of livelihood (Bacigalupe & Lambe, 2011; Barth & Veit, 2011). Due to specific socio-cultural and socio-economic backgrounds, immigrants possess unique characteristics that play an important role in their adjustment to and integration into a new country environment. Adjusting to a new environment is not easy for many immigrants because of several factors, including linguistic and cultural differences,

limited or no education, low income, high competition for job opportunities, and others. Moreover, several studies show that ICTs, including computers and the Internet, can help immigrants with a successful transition (see Alam & Imran, 2015; Barth & Veit, 2011; Benitez, 2006; Chen, 2010).

What Motivated Immigrants to Use ICTs?

This study identified two key motivations for ICT adoption and use by immigrants. First, adjustment to and integration within the new host country environment through ICTs was the most discussed theme among the selected articles. The second most important theme was the connection of immigrants with their family and friends back home through various ICTs. Specifically, 12 of the 20 articles emphasized both motivations of immigrants with respect to ICT adoption and use. Six articles focused on the first motivation and two articles highlighted the second motivation.

Eighteen of the 20 articles discussed various reasons for immigrants to use ICTs: expanding their social circle; adjusting to their neighborhood; establishing and sustaining ethnic and sociocultural networks in their host countries; retrieving information required for everyday activities (such as banking and shopping); familiarizing children with the new country; and enhancing education. Fourteen of the studies emphasized that back home connections through ICTs are important for motivating immigrants during the difficult transition. It provided them with a sense of collective familyhood as it helped them to overcome social isolation and post-migration stress (Mikal & Woodfield, 2015; Selsky et al., 2013; Spaiser, 2013). Accordingly, Mikal and Woodfield (2015, p. 1330) described ICTs as “tools for stress reduction.”

The aforementioned motivations of immigrants with respect to adopting and using ICTs are a part of diasporic communication. There are four categories of diasporic communication: (1) intra-diasporic (immigrants' communications with other local immigrants of the same ethnicity); (2) inter-diasporic (immigrants' communications with immigrants of different ethnicities in the host country or beyond); (3) diaspora-host (immigrants' communications with people from different communities and ethnicities within the host country); and (4) diaspora-homeland communication (immigrants' communications with family and friends living in the home country) (Benitez, 2006). Since immigrants, particularly more recent ones, generally have poor intra-diasporic and inter-diasporic communication skills because of their limited abilities in using the host country language, limited ICT skills, and cultural differences, the articles selected for this study focused mainly on diaspora-host and diaspora-homeland communication (Benitez, 2006; Chen, 2010).

Drawing from the selected articles, it was found that immigrants' motivation for ICT adoption and use was unique and did not remain intact for a long time. Rather, immigrants' communication with people back home slowly faded. In turn, interaction with local people in the host country gradually increased. In comparison to recent immigrants, more settled immigrants were less likely to interact with people back home and less likely to visit websites from the country of origin (Benitez, 2006; Chen, 2010; Mesch, 2012). They were more likely to use the host country language

in communication, interact with local people in the community, visit and use host country websites, and read or watch local news media (Chen, 2010). Likewise, immigrants' legal status in the host country influenced their use of ICTs. Immigrants with temporary residence status were more likely to interact with their family and friends back home than were other permanent residents (Mikal & Woodfield, 2015). Similarly, second-generation immigrants were generally completely engaged in the host country environment and seldom connected with anyone living in the country of origin (Baycan et al., 2012). Older immigrants, however, used ICTs to look at information from their past and disengage from the unfamiliarity of the host community (Khvorostianov et al., 2011).

Which Factors Influenced Immigrants' Adoption and Non-Adoption of ICTs?

There were several factors influencing immigrants' decisions to adopt and use ICTs. The following were commonly referred to in the selected articles¹: (1) age; (2) education; (3) income; (4) culture; (5) ICT skills; (6) language; and (7) attitude. Age, referred to in 13 of the articles, significantly influenced immigrants' decisions to adopt or not to adopt ICTs. A young immigrant, for instance, was more likely to use ICTs because of his or her physical ability and passion to learn. An older immigrant tended to avoid complex technological devices. Immigrants with high incomes, education, proficiency in the host country language, skillful handling of ICT devices, and positive feelings toward new technology were very likely to adopt and use ICT devices during their settlement process in the host country. When their socio-cultural values were not directly challenged by ICTs or the host country environment, immigrants were more likely to use ICTs and interact with locals (Chen, 2010; Tripp, 2010; Tsai, 2006). Based on these influencing factors, there was a low probability that an elderly immigrant with a limited education, low income, unfamiliarity with the local language, and limited ICT skills would adopt and use a computer or the Internet.

Some cultures are restrictive and do not permit children and women to use computers and the Internet because they are considered to be a gateway to inappropriate content (Kabbar & Crump, 2006; Tripp, 2010). They are also afraid that children and women would come into contact with strangers. Finally, some cultures fear the risk of privacy infringement through ICT devices. Technology adoption (or non-adoption) is also related to the attitude, willingness, and motivation of individual users (Davis et al., 1989; Liao et al., 2009). It has been shown that some immigrants are hesitant and/or demotivated with respect to ICT adoption and use because of the stress and anxiety that they feel toward complex technology.

The aforementioned factors are important to technology adoption. According to TAM, perceived usefulness of technology and perceived ease of use are key factors in users' attitudes toward technology adoption and use (Davis et al., 1989). Perceived risks demotivate people to adopt and use ICTs. In some of the selected studies (see Bacigalupe & Càmarà, 2012; Chen, 2010; Kabbar & Crump, 2006, 2007; Selsky et al., 2013), for instance, immigrants were found to be hesitant and confused with respect

to ICT adoption in that they wanted to experience the benefits of ICT use but they feared the risks (for example, privacy infringement).

To conclude, the articles selected for this study emphasized two key motivations with respect to immigrants' ICT adoption and use: (1) adjustment to and integration within the host country environment and (2) connections to individuals back home. Not surprisingly, immigrants adopt and use ICTs for a smooth transition into and adjustment to a new setting. ICTs facilitate their learning of the host country language, their understanding of its socio-cultural values, and their exploration of opportunities (for example, education, employment, and socialization). Likewise, a connection through ICTs is important as it allows immigrants to keep in touch with family and friends in the country of origin, avoid negative psychological effects of isolation in the host country, and build and sustain transnational identities. As discussed, there are seven identified factors influencing immigrants' motivation to use ICTs. Where immigrants fall with respect to these factors can motivate or demotivate them to adopt and use ICTs. Furthermore, these influencing factors are indicators of digital divides. Without bridging these divides, immigrants may not adopt and use ICTs for a smooth transition within a new country environment.

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ENDNOTES

- ¹ Scholars use various names to denote factors, such as employment, cost, affordability, peer-pressure, neighborhood factor, and gender. For the purpose of this article, the terms employment, cost, and affordability are incorporated within income; peer-pressure and neighborhood factors are incorporated within attitudes. Similarly, gender is incorporated within culture because different treatment based on gender in a particular ethnicity is a cultural issue.

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