The Factors that Influence the Adoption or Non-Adoption of
Information and Communication Technologies (ICTs) by
Recently-arrived Immigrants in the Wellington Region

A thesis presented in partial fulfilment of the requirements for
the degree of

Master of Business Information
(MBusInf)

at

Massey University
Wellington
New Zealand

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2005

Abstract

The purpose of this qualitative study was to better understand recent immigrants' perceptions of ICTs, what causes them to adopt or not adopt ICTs, and the factors that influence such action.

A self-selected, volunteer sample of 32 recent immigrants living in 15 households, between the ages of 12 - 65 and who came from developing countries that include Africa (5), the Middle East (4), Central Asia (3) and South East Asia (2) participated in the research. The Refugee and Migrants' Service (RMS), Wellington branch, and ethnic community leaders supported the study and introduced the researcher to potential participants.

Two rounds of semi-structured, in-depth audio-taped interviews were held in the immigrants' own homes. The aim of the first round of interviews was to establish trust with the volunteers. The second round of interviews occurred six weeks later. The follow-up interviews provided an opportunity for both the researcher and the participants to validate the transcribed interviews as well as allowing further discussion on their ICT adoption.

The majority of participants interviewed had a positive attitude towards ICTs. They viewed the technology as a useful tool because they saw relative-advantage benefits such as accomplishing tasks more easily, saving money on communication and finding employment.

A priority on home access was evident for nearly half the interviewees who owned their computers (despite participants being low-waged and some unemployed). The major method of adoption for the immigrants who were new to computing was via friends and family. The personal one-to-one teaching, in a safe, relaxed environment was important to many migrants, as was the timeliness of the teaching.

Overall, the results show that young, male participants with a relatively higher educational background were more likely to be adopters. In contrast, older female participants with little or no education were less likely to participate in ICTs. The results also show that the majority of the participants lacked computing experience.

This study was exploratory in nature, therefore there is opportunity for researchers interested in understanding ICTs adoption to build on these research findings and explore in greater detail a range of factors that influence recent immigrants' adoption or non adoption of ICTs. The findings have important implication for policy makers and practitioners who wish to create an inclusive society where all members, including recent immigrants, are able to access and use ICTs and hence be able to fully participate in the information society. Recommendations, based on the study's findings, include suggestions to promote ICTs among recently-arrived immigrants community.

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CHAPTER 1

INTRODUCTION

Research indicates that to effectively participate in today's global digital information age, Information and Communication Technologies (ICTs) literacy is essential for individuals and communities. Research also indicates that advances in, and the rapid growth of, ICTs has created a new form of inequality among individuals in developed societies. The New Zealand government recognises the potential for some sections of society to be alienated from the new digital environment and has indicated commitment to creating an inclusive society where all individuals have the opportunity to access and effectively use ICTs.

New Zealand is a multicultural society, with nearly 20 percent of the population being immigrants from more than 140 countries (Statistics New Zealand, 2002b). Immigrants face unique and challenging situations in their early settlement years (Gubbay and Cogill, 1988). For immigrants from countries where ICTs are not ubiquitous an additional challenge will be adjusting to life in a society where computers are commonplace. These immigrants are often at risk of being on the wrong side of the digital divide, living in "informational cities" that "deepen existing patterns of socio-spatial segregation" (Castells, 1999, p. 25).

Many governments are aware of the need for a digitally inclusive society where all sectors have access, and the knowledge, to use ICTs. Over the past decade national surveys in the United States have monitored who is, and who is not, participating in this digital world. The 2002 report found that despite over half the American population being online, noticeable divides existed based on education, income, age and race (NTIA, 2002). European and Australian data provide a similar picture of access and social inequalities

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(Burrows, Loader, Pleace, Nettleton, and Muncer, 2000; Hellwig and Lloyd, 2000) and a recent New Zealand report shows that despite various initiatives to bridge the divide individuals on low incomes, sole parents, older people, those with no or low qualifications or poor literacy, the unemployed, and people with disabilities are at risk of exclusion from the digital age (Cullen, 2001). New immigrants are often over-represented in several of these groups.

Research Objectives

This study investigated the factors influencing the adoption and non adoption of ICTs by recently-arrived immigrants; those who live in New Zealand and who first arrived to live here five years ago or less (New Zealand Immigration Service, 2003). The study objectives were to:

1. understand recently-arrived immigrants' perceptions of ICTs,

2. examine the factors that influence immigrants' adoption and non adoption of ICTs,

3. understand the process followed by recently-arrived immigrants when adopting ICTs, and

4. make recommendations, where appropriate, to assist in promoting ICTs usage among the immigrant community.

Overview of Method

To meet the objectives of this study a qualitative research approach was used to collect data from recent immigrants. To gather this data, contact was made

via the Refugee and Migrant Services (RMS). This organisation assisted with recruitment of the sample. The immigrants participated in two rounds of in-depth semi-structured interviews of approximately 45 minutes. These were audio-taped and transcribed by the researcher prior to analysis which was assisted by a qualitative software program.

Ethical approval for this study was obtained from Massey University's Human Ethics Committee (MUHEC) and the director of the RMS approved the study and facilitated contact with the sample participants. The research was carried out in two parts. First an extensive search of relevant literature was conducted. Second, empirical data were collected from the target population of recent immigrants from developing countries and who live in the Wellington region. The 32 participants lived in 15 households and had immigrated from Africa, the Middle East, Central Asia and South East Asia. The data was then analysed in the context of Rogers' Diffusion of Innovation (DOI) and Warschauer's Technology for Social Inclusion which provided a theoretical basis for the study.

Justification for the Research

This study is important for many reasons, not least for the consequences to society resulting from inequalities in the skills in, and usage of, ICTs. As van Dijk and Hacker (2003) note, a fundamental task of society is to prevent these inequalities from cementing into *structural* (authors' emphasis) inequalities where they "solidify" and become barriers to advancement in society. This refers to the positions that "people occupy in society, in social networks, and in media networks, or other media [to the extent that they] become lasting and determine to a large degree whether they have any influence on decisions made in several fields of society." (p. 324). Recent immigrants, especially refugees from developing countries, face the many challenges of resettlement

and have been identified as being potentially "at risk" of ICT exclusion. Identifying the factors that influence adoption or non adoption of ICTs is therefore an important first step to understanding what is required to promote ICTs adoption among this group.

The study is particularly valid at this time because of the New Zealand government's Draft Digital Strategy which was released for consultation in June 2004 and has subsequently resulted in the New Zealand Digital Strategy which was released in May 2005. The purpose of the strategy is to identify the necessary conditions for New Zealand to take advantage of, and enable its citizens to benefit from, new opportunities that ICTs provide. Until recently, the government's focus has been on technological change. For instance, $16 million has been spent in the past four years to fund an e-government initiative, the most visible outcome being a "one stop shop" web site allowing the public to access government information and services (see http://www.govt.nz). However it is recognised that the technical and business aspects of e-government will not ensure involvement of all New Zealanders. The Digital Strategy emphasises not only business and government but has a cultural and social focus on communities, thus recognising the need to provide an integrated and cohesive framework that encourages the uptake and effective use of ICTs by all citizens. The literature review has revealed that little is known of the adoption (or non adoption) of ICTs by recent immigrants. This study will provide a better understanding of how this potentially marginalised group perceives ICTs.

Organisation of the Thesis

This thesis is divided into five chapters. Chapter 1 introduces the concepts and importance of ICTs in creating a socially inclusive society, outlines the justification for this research and presents the research objectives and design.

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Chapter 2 reviews the international and national literature related to the digital divide and the barriers to ICT adoption by societal groups. The research on ICTs for social-inclusion are discussed. The immigrant literature explores the challenges facing new immigrants and the importance of ICTs as a facilitator in their re-settlement process. Finally the chapter presents Rogers' Diffusion of Innovation Framework, along with alternative models that have been built on Rogers' work. These theories provide the theoretical framework for this study.

The qualitative research approach employed for this study is presented and discussed in Chapter 3. The sample selection, data collection, ethical and cultural issues are described and an overview of the data analysis is provided.

Chapter 4 presents the results of the semi-structured interviews, organised and categorised into five major themes.

The final chapter summaries the purpose of this study, the approaches taken and the findings. Limitations of this study are discussed and the chapter concludes by presenting implications for policy makers and practitioners who wish to promote ICTs adoption and makes suggestions for future research directions.

CHAPTER 2

LITERATURE REVIEW

Introduction

The advances in, and the rapid adoption rate of, ICTs has led to an e-society where it is generally accepted that people can benefit both socially and economically. As ICTs are increasingly becoming critical to modern knowledge societies, it is important that all sectors of society are able to take advantage of such technology. However adoption of ICTs has not been equitable across societal sections and this has led to what is known as the 'digital divide'. Immigrants, especially those from counties where ICTs are not ubiquitous, are likely to be an "at risk group".

This chapter describes and discusses first, the notion of the digital divide and its implications for social inclusion/exclusion. Second, a review is presented of the international literature pertinent to immigrants and ICTs. This begins with a review of the literature related to New Zealand immigrants and the settlement challenges facing them. Finally the chapter examines and describes the theoretical frameworks that underpin the adoption of technology, and examines those that are used to guide this study.

The Digital Divide

Early definitions of the digital divide, believed to be a "simplifying metaphor" by van Dijk and Hacker (2003) refer to the gap that exists between those who have and those who do not have access to technologies such as telephones,

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computers, Internet access and related services. The focus of the early digital divide literature was on access to, and adoption rates of, ICTs by different sectors of society. Implementing Warschauer's (2003) social inclusion framework for effective adoption and use of ICTs has been successful in mitigating the barriers which may be experienced by initial users, especially those identified as at risk groups such as new immigrants.

Monitoring of who was and who was not online in the United States was undertaken by the first National Telecommunication and Information Administration (NTIA) report 'Falling Through The Net' in 1994. This report identified disparities in computer access and use between various social, economic and ethnic groups in the United States. Since then the NTIA has produced a series of reports to monitor this gap. The fourth report, published in October 2000, has shown that while there is an overall increase in the number of households with access to the Internet, computer ownership, and the total number of individuals using the Internet among all groups, the "digital divide remains or has expanded slightly in some cases..." (NTIA, 2000, p. xvi). People with disabilities were reported as being only half as likely to have access to the Internet as those without disabilities. It also reveals that, there is a large gap in Internet penetration (number of households having Internet access) and individual Internet usage among the Black and Hispanic ethnic groups when measured against the national average. While one third of the United States population used the Internet at home, only 16.1 percent and 19.9 percent of Hispanic and Blacks respectively used the Internet at home.

However, the most recent NTIA report (NTIA, 2002) states that "the Internet has become a tool that is accessible to and adopted by Americans in communities across the nation" (p. 93). This report shows that more Americans are accessing computers and the Internet at work, and that approximately two million more people become Internet users every month, and that over 50 percent Americans are now online. The report argues that the presence of computers and Internet resources at school provides children

who lack these resources at home with the opportunity to gain skills and familiarity with new technologies. However, even in a technologically advanced country such as the United States, there remain many people who face barriers to ICTs adoption. These barriers are varied and are experienced by different sectors of society, and in different countries.

Barriers to ICTs Adoption

Physical Access Barrier

Van Dijk (1999) identifies four types of technology access barriers. The first type is "mental access" caused by lack of interest and computer anxiety. Those who encounter a mental access barriers are likely to have no, or a negative, elementary digital experience. The second barrier is "material access", that is, lack of access to physical resources such as computer equipment and network connectivity. The third access barrier is "skills access" and is due to inadequate education and social support as well as a lack of a available user-friendly technologies. The last barrier is "usage access" caused by no, or limited usage opportunities. For ethnic minority groups to be able to fully participate in the information society, all these different types of access to technology are equally important.

In a recent review of the burgeoning literature available on ICT access and usage in the United States and the European Union, van Dijk and Hacker (2003) present four interpretations concerning the digital divide which they believe have been influenced according to political or subjective perspectives. The first interpretation denies or trivialises the existence of a digital divide on the basis of three arguments as follows: adoption and usage rates of computers and the Internet are higher than any other prior medium; the distribution among the population approaches normality; and computers and Internet connections are increasingly affordable. The second interpretation

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accepts there are some divides but that these will soon disappear. Van Dijk and Hacker criticise this, believing that the digital divide is about "relative differences between categories of people" (p. 321). The third interpretation relates to the claim that information inequality is just another layer on the old inequalities of income, education, occupation or social class, ethnicity, and gender. While van Dijk and Hacker (2003) accept that there are elements of truth in this stance, they believe it underestimates the complexity of changes in an information society and state that "increasing differences in the skill and usage of the new information technologies might lead to new inequalities of a nature not known before ..." (p. 322).

Van Dijk and Hacker's analysis is based on data from two developed nations, the Netherlands and the United States. However, the 'digital divide' term does not only apply to the disparities in access to and usage of ICTs between social groups within developed nations, but it also reflects the gap that exists between developed and developing nations. For example the latest statistics on global Internet usage show that Internet penetration[1] in Africa and the Middle East are 1.4 percent and 6.7 percent respectively in regions that comprise 19 percent of the world population (14 and 4 percent respectively). In comparison Internet penetration in North America and Europe are 66.5 percent and 31.6 percent respectively in regions that make 5.1 and 11.4 percent of the total world population (Miniwatts International, 2005). New Zealand figures are similar to the United States and Europe. The 2001 census statistics show that 37 percent of households have access to the Internet. More recent figures provided by Nielson Net Ratings show that New Zealand's Internet penetration rate has increased to 51.2 percent (Miniwatts International, 2005).

The comparative statistics discussed above for ICT usage and Internet access by citizens of developing and developed countries show significant disparity. It is therefore reasonable to assume that many immigrants from

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[1] The percentage of the population that use the Internet

developing countries will not be familiar with ICTs. In addition, they will be facing the challenges of resettlement and for them to readily adopt ICTs will require more than simple access to the technologies.

Van Djik and Hacker (2003) believe that physical access to ICTs is but the first step in adoption and once that has been satisfied, the "social-cultural differences of age, gender, literacy, and informacy come forward" (p. 323). Provision of a socially-inclusive approach to encourage adoption of ICTs by a potentially marginalised group such as refugee immigrants is, therefore, very important. Another barrier relates to the type of ICTs content.

Content Barrier

The importance of relevant, useful online content was not considered to be a major factor until a study by The Children's Partnership (Lazarus and Mora, 2000) which found lack of appropriate content was a more significant factor in maintaining the digital divide once the lack of hardware was addressed.

Internet content has been identified by many researchers as a central barrier to creating a "clear surplus value" (van Dijk and Hacker, 2003, p. 325). In a knowledge-based economy information is regarded as a positional good. This implies that one's position in society is increasingly dependent on who gets information first (van Dijk and Hacker, 2003). The cost of physical resources of hardware and software has steadily declined over the recent decades, meaning that physical access to ICTs for some minority and disadvantaged groups is more affordable, thus being less of a barrier to ICT adoption than previously. Once access is no longer an issue, the importance of relevant online content becomes a central issue in attracting and maintaining the interest of groups on the wrong side of the digital divide.

Hellawell (2001) identifies the lack of relevant content, rather than the physical access to technology, as the critical ICTs adoption barrier facing many

disadvantaged groups in Western societies. The study commissioned by The Children's Partnership Organisation in the United States, identifies the lack of local information in online content, literacy issues, language difficulties, and the dearth of culturally diverse online content as significant barriers to Internet adoption by many disadvantaged communities in the United States (Lazarus and Mora, 2000). A third study found that the lack of relevant or interesting content is the main barrier which prevents ethnic groups living in Western societies from accessing the Internet (Cullen, 2001).

Developing online content that is easily accessible by all sectors of society is particularly important in an e-society. The World Public Sector Report identified the importance of all societal sector participation as a condition for e-government initiatives to be successful as a tool for development. The report states that

> The potential of e-government as a development tool hinges upon three prerequisites - a minimum threshold level of technological infrastructure, human capital and e-connectivity - for all. E-government readiness strategies and programmes will be able to be effective and 'include all' people only if, at the very minimum, all have functional literacy and education, which includes knowledge of computer and Internet use; all are connected to a computer; and all have access to the Internet. The primary challenge of e-government for development therefore, is how to accomplish this (United Nations, 2003b, p. 128).

The emergence of an e-society in many developed nations has resulted in e-government projects, many of which aim at better understanding and meeting of individual needs and encouraging participation in government and the democratic process. However in order to for all sectors of society to fully participate in e-government many conditions need to be met. These include the supply of physical resources, ensuring users have the skills and abilities to use them, as well as the provision of suitable content (Carvin, Hill, and Smothers, 2004).

This section has presented an overview of the digital divide and the potential for some societal groups to be excluded from knowledge-based societies.

Barriers to ICTS adoption have been identified and the importance of a socially inclusive approach discussed. The next section presents an overview of the major reports and research studies that examine the role of ICTs in creating a more inclusive society.

ICTs and Social Inclusion

Social inclusion refers to the extent to which individuals or groups are able to fully participate in society and control their own destinies (Warschauer, 2003). Factors that affect the extent of social inclusion include accessibility to, and availability of, economic resources, employment, health, education, housing, culture and civic engagement (Warschauer, 2003).

Initiatives aimed at combating social exclusion have been implemented by many governments and international agencies around the world. Warschauer (2003) notes that these include the European Union, the federal government of Brazil and the United States who recognise the importance of using ICTs as a tool for social inclusion. A typical goal for many Western governments is "to exploit fully the potential of the knowledge-based society and of new information and communication technologies and ensure that no-one is excluded ..." (European Commission, 2005, p.11).

Migration has been identified as another factor impacting on social exclusion, particularly for those from developing countries who may not have been previously exposed to ICTs and who come to live in a knowledge-based society. A recent report by the trans-European network of universities and their partners in education and training examined the factors which lead to social exclusion in Europe. Immigrants were identified as one of the groups that were more likely to face social exclusion in their new country (EuroPACE,

2003). The lack of a social network to help immigrants to become integrated into society was given as a major reason for this. Other factors that were identified as leading to social exclusion include the lack of social status and absence of work, both of which are predominant among the immigrant community. Further, the report presents the potential of ICTs and online services to fight social exclusion through the distribution of knowledge "more creatively and more equally" (p.3).

Technology and a Social Inclusion Framework

Warschauer (2003) believes there is need for a socially inclusive approach because of the recent technological changes and their impact on society. These changes are first, the emergence of the new information economy and the network society; second, the critical role that ICTs play in all aspects of the new economy and society; and third, the recognition that access to ICTs determines the difference between marginalisation and inclusion in the new economy and society that have the potential to add to existing inequalities.

The notion of the digital divide implies a 'digital solution'; that is, the provision of ICTs components such as hardware and software. However, Warschauer (2003) believes that important complementary resources and complex interventions required to support social inclusion in which technology plays an enabling role are often not addressed. The technology should encourage people to participate fully in the information society, rather than be viewed as an end solution in itself. Warschauer states that:

> Participation requires not only physical access to computers and connectivity, but also access to the requisite skills and knowledge, content and language, and community and social support to be able to use ICT for meaningful ends. (Warschauer, 2003, p. 216)

Warschauer suggests four categories of resources that enable the use of technology for social development. These resources are physical access, digital resources, human resources, and social resources (see Figure 2.1). He further explains that these resources have an iterative relationship with ICT use. While each resource is a contributor to the effective use of ICT, at the same time each resource is a result of that effective use of ICT. The success of the use of technology to promote social inclusion among disadvantaged groups depends largely on how well these resources are handled. For successful ICT adoption by a potentially disadvantaged group such as refugees, the physical resources as well as human and social resources are required.

Physical Resources (Computers and Telecommunication)	**Digital Resources** (Relevant content in Diverse Languages)	**Human Resources** (Literacy and Education)	**Physical Resources** (Community and Institutional support)

Effective Use of ICTs to Access, Adapt, and Create Knowledge

Physical Resources (Computers and Telecommunication)	**Digital Resources** (Relevant content in Diverse Languages)	**Human Resources** (Literacy and Education)	**Physical Resources** (Community and Institutional support)

Figure 2.1: Resources contributing towards ICT access
Note: From Warschauer (2003, p. 47)

Warschauer's position is endorsed by van Dijk (1999) who argues that inequalities in ICT access go beyond the lack of computing and Internet equipment to include issues related to content, language, education, literacy and community. He states that access to technology (or the lack of access) is a multifaceted concept. He presents a more comprehensive framework to help better understand issues related to technology access.

New Zealand's ICT Vision for an Inclusive Society

In June 2000 the New Zealand government presented its vision for a socially and economically inclusive society in the form of a paper which was discussed by the Cabinet (Maharey and Swain, 2000). It was stated in this document that the government aims for all New Zealanders, individuals and members of communities, to participate fully in the economic, social, educational, cultural and democratic opportunities available in an information society. The use of current and emerging ICTs play a central role in this vision. With the ubiquity of ICTs in New Zealand, it is important that all sectors of our society are not disadvantaged through the lack of opportunities to participate in computing. The use of ICTs, if diffused and adopted in a timely and appropriate manner, will provide opportunities for learning and fuller societal involvement.

In June 2004 the New Zealand government released its Draft Digital Strategy for consultation which has subsequently resulted in the New Zealand Digital Strategy (see http://www.digitalstrategy.govt.nz). The purpose of this strategy is to identify the necessary conditions for New Zealand to take advantage of, and enable its citizens to benefit from, new opportunities that ICTs provide. Three interrelated areas have been identified as important to realising the full potential of ICTs by all New Zealanders so that they may reap social and economic benefits. They are: Confidence, Content and Connection depicted on the outside of the triangle in Figure 2.2. The three inner circles represent the societal sectors of Communities, Government and Business, all of which would benefit from ICTs.
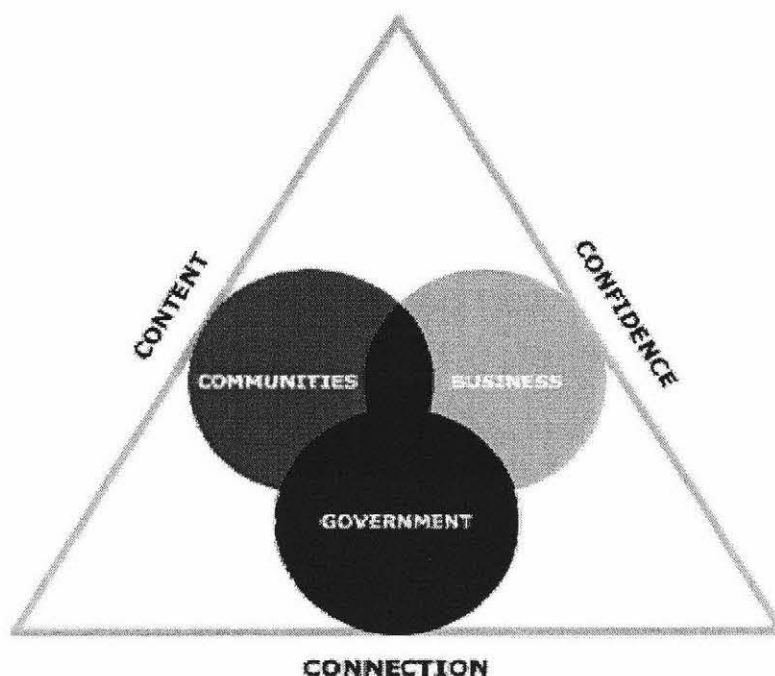
Figure 2.2. The conditions necessary for realising ICTs benefits.
Note: From New Zealand Government (2004)

The three areas of Confidence, Content and Connection are important to recent immigrants, especially those from developing countries. Many people in this category often lack the necessary skills, the ability and confidence to use ICTs which negatively affects their ICT experience. The skills required to confidently use ICTs include both functional and digital literacy as well as the ability to participate in an interactive electronic environment. For all immigrants appropriate content is essential in order that they see relevance in their use of ICTs as well as enabling access to information essential in their settlement process. The third condition, connection, required to realize the New Zealand government digital strategy, is equally important for recent immigrants from developing countries, particularly those with a refugee background, as connectivity provides another avenue for accessing many government-provided resources as well as accessing employment sites.

The next section reviews literature about the immigrants' resettlement process and discusses studies that relate to immigrants and ICTs.

Immigrants

International migration is reported to have a positive impact on the social and economic life of developed countries (Norman and Miekle, 1985). More recently this view has been reiterated by the New Zealand government's Minister of Immigration who believes that immigration is vital for New Zealand's future well-being. He states that:

> Immigration assists with capacity building, sustainable economic growth and innovation. We are now part of a global community and immigrants help New Zealand to stay connected with the rest of the world (New Zealand Immigration Service, 2004, p. iii).

Immigrants face a unique and challenging situation when they settle in their adopted country. The challenges may include learning a new language, adapting to different food, culture and adapting to new systems and expectations (Ho, Cheung, Bedford, and Leung, 2000). For immigrants from countries where ICTs are not ubiquitous an additional issue will be adjusting to life in a society where computers are commonplace. Awareness of, and familiarisation with, ICTs are increasingly necessary for participation in knowledge societies.

Immigrants, of course, arrive in their new country with disparate cultural, economic and social backgrounds. For example, some arrive from poor agricultural-rural societies, others from wealthy urban-industrial ones. In New Zealand, immigrants come from over 140 countries (New Zealand Immigration Service, 2003). According to the 2001 census data (Statistics New Zealand, 2002b) 698,628 people stated that they were born overseas. This group makes up 19.5 percent of the total New Zealand population. The vast majority of New Zealand's overseas-born population come from the United Kingdom, Ireland and the Oceania region (which includes Australia and the Pacific Islands). In 2001, there were 225,120 people living in New Zealand who had been born in the United Kingdom or Ireland. However, more than one-quarter (27.5 percent) of the overseas-born population who had been living here for

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less than five years are from North-East Asia, Southern and Central Asia, North Africa, the Middle East and Sub-Saharan Africa. Many of these nations are developing countries and some have experienced years of war.

Knowledge and skills in relation to technology for immigrants who come from developed countries where there is a high rate of ICT access by many sectors of the population contrast with many immigrants from developing countries. Many developing countries lack an adequate and robust ICT infrastructure with a consequence that the majority of the population has a low level of access to ICTs. This situation has been identified as a concern by the United Nations first annual report of the Information and Communication Technologies Task Force (United Nations, 2003a). The report revealed a significant gap in access to ICTs between developed and developing nations over the recent decade (between 1991 and 2001).

New Zealand Immigrants

Immigrants in New Zealand are concentrated in the main centres of Auckland, Wellington, Christchurch, Hamilton and Dunedin. According to the 2001 census data, the Wellington region had New Zealand's third largest population, after Auckland and Canterbury, with 423,765 people, that is, 11.3 percent of the total population of New Zealand. Wellington is a multicultural capital city characterised by a large ethnic diversity. The city had the second highest proportion of immigrants in New Zealand after Auckland. Nearly one quarter of Wellington's population, 74,829 (23 percent), are immigrants (Statistics New Zealand, 2002a) with a significant number arriving from developing countries. The fastest growing group among the ethnic sector of recent immigrants is from the Sub-Saharan Africa region (Statistics New Zealand, 2002b). Table 2.1 shows that the majority of immigrants (48 percent) are from Europe, South Africa and North America, followed by immigrants from the Pacific region (19 percent). However, a significant number of

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immigrants (26 percent) are from South East Asia, North Asia, South Asia and other regions.

Despite the rapid increase in the size and ethnic diversity of recent immigrants to New Zealand there is little known about the settlement experience of recent immigrants and in particular their adoption of ICTs and adjustment to an e-society. Trlin, North, Pernice, and Henderson (1998) argue that there is a lack of sustained longitudinal investigations to reveal the challenges faced by recently -arrived immigrants. Such a study will not only help in revealing how recent immigrants successfully integrate into the new society but will also reveal the failure in achieving to do so. The New Zealand Immigration Services (NZIS) is planning to conduct a longitudinal research study focusing on recently -arrived immigrants. The report of a pilot survey has just been published in April 2004 with the study due to begin in 2005 and expected to finish by 2009. The study will highlight the resettlement experience of new immigrants and how they adjust to living in a society where ICTs are part of every day life. Certainly for immigrants with no, or minimal, ICTs background, valuable insights will be revealed upon the completion of this study.

Table 2.1

Percentage of Immigrants and their Region of Origin in the Wellington Area.

Region of origin	Percentage
ESANA[*]	48
Pacific	19
South East Asia	8
North Asia	7
Australia	7
South Asia	6
Others	5

Note. ESANA[*] = Immigrants from Europe (including Russia), South Africa and North America.
Note: From Statistics New Zealand (2002b)

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Immigrants, Employment and ICTs

Difficulties of recent immigrants in finding suitable employment in their adopted country have attracted the attention of international and national researchers in that field. For example, several United Kingdom studies have established that ethnic minorities, including recent immigrants, encounter substantial difficulties in gaining work opportunities (Brown and Gay, 1985; Jones, 1993; Smith, 1974). Another study from Switzerland examines the difficulties that recent immigrants, particularly those from developing countries face in gaining employment. The Swiss statistics show that immigrants from developing countries have a higher unemployment rate, 30 percent, compared with the less than 4 percent national unemployment average (Chonia, 2002).

Recent immigrants to New Zealand face similar difficulties. For instance in June 2000 there was a 17 percent employment rate gap between recent immigrants and those born in New Zealand (Department of Labour, 2001). The causes of recent immigrants' employment problems have been the focus of several resettlement research studies in New Zealand. Winkelmann and Winkelmann (1998) argue that this high unemployment rate is attributable to educational qualifications, years in New Zealand, and region of origin as well as lack of recognition of overseas qualifications by different professional registration boards in New Zealand, lack of New Zealand experience, and difficulties with the English language.

Most immigrant resettlement literature in New Zealand emphasises the importance of learning English, adapting to the new culture and finding employment as important factors for effective resettlement (Ethnic Affairs Service, 1996; Gubbay and Cogill, 1988; New Zealand Immigration Service, 2000; Waite, 1992). Because ICTs play an increasingly central role in the workplace, knowledge and experience with ICTs are becoming a necessary

requirement for many occupations. The importance is emphasised by Fleisher (cited in Mitchell, 2002) when he says

> Not knowing how to and being unable to access technologies designed to communicate digital information, such as the Internet, may, in the future, be equivalent to not knowing how to read and write today (p. 2).

In 1996 a research study was commissioned by the New Zealand Ethnic Affairs Services to address qualifications, training and employment issues facing recent immigrants to New Zealand. One of the main objectives of the research was to "fill the gap in knowledge about immigrants' employment in New Zealand" (Ethnic Affairs Service, 1996). The research investigated whether immigrants were "well placed" or "under utilized" and identified barriers immigrants had to overcome to find employment congruent with their training and experience. The study was also intended to provide useful information about the crucial aspects of the settlement process. A postal survey was completed by 500 recent immigrants (those who had lived in New Zealand for less than five years), and 12 in-depth interviews were conducted with selected immigrants. Data collection also involved a survey of professional registration boards such as the Medical Council of New Zealand, and the Electrical Workers' Registration Board. The research found that recent immigrants, especially those from ethnic minorities, often face great difficulties in gaining employment and most of them are either unemployed or are working in positions beneath their educational attainment and experience. The research concluded that:

> Immigrants, particularly those from ethnic minority backgrounds, often face formidable barriers to employment opportunities in New Zealand (Ethnic Affairs Service, 1996, p. 1)

However, immigrants with a good command of the English language and with qualifications in the science and computing fields had the least trouble gaining employment. The survey found that:

> Job prospects were generally better for those who were fully fluent or fluent in English. They were more likely to have gained jobs in the field of their qualifications. However in some occupations (science, skilled

trades, computing), fluency in English appeared to be less of an obstacle. (Ethnic Affairs Service, 1996, p. 38)

ICTs can positively affect the recent immigrants' chances of gaining education, gaining suitable employment and settling in their adopted countries. As well, recent research from the United States suggests that there is a strong positive relationship between the presence of computers and the Internet at home and the academic outcomes of school children, particularly for children from these disadvantaged groups Wilhelm (cited in McLaren and Zapala, 2002).

In the United States, the director of the Central American Resource Center (CARECEN), a Los Angeles organisation that provides access to ICTs, basic training, and other resources to disadvantaged communities in general, and to recent immigrants in particular, stated that "These people [immigrants] know that technology is there and that if they want to better their job possibilities they need to learn computer skills" (Morris, 2001). For immigrants who lack adequate ICTs knowledge and skills, the possibility of gaining work becomes harder and more challenging, especially in a country like New Zealand where most jobs require at least some basic ICTs familiarisation. The next section will review the literature related to immigrants and ICTs both internationally and within the New Zealand context.

Immigrants and Adoption of ICTs

An extensive and systematic search of research databases and web resources confirmed Campbell's (2002) assertion that there is a paucity of literature related to immigrants' use of computer-based communications technologies and their impact, particularly within the New Zealand context.

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This section discusses the Campbell survey followed by two international studies that examined immigrants and ICTs in Ireland and Switzerland.

The results of a survey about the adoption and use of ICTs by immigrants to New Zealand was reported by Campbell (2002). This was part of a larger study that aimed to identify and explain some of the major social-cultural impacts of ICTs on other groups such as women, senior citizens and Maori. A total of 2,850 postal questionnaires with a mix of open and closed questions were distributed to immigrants via different government agencies and community organisation. This resulted in a response rate of 12.67 percent (n = 361). The study found that the majority of immigrants who participated in the study reported using ICTs extensively and often, for both word processing and accessing the Internet. This clearly indicates that the group of immigrants who responded were among the adopters of ICTs and had a high access level to the technologies. The sample was well above the national average of 37 percent of households having access to the Internet (Statistics New Zealand, 2002a). The 2005 figure is reported as 56.8 percent (Miniwatts International, 2005). The majority of immigrants in the study used the Internet to contact friends and families overseas and within New Zealand, to catch up with the news in their country of origin and to visit websites that have content relevant to their culture.

While Campbell's (2002) study provided useful insights to immigrants' use of ICTs Campbell recognises there were some limitations of the study. First, the response rate to the postal survey was low and hence the results cannot be said to be representative of immigrant groups in New Zealand. Second, the respondents to the questionnaire were relatively well educated immigrants (64 percent of the respondents had a bachelor's degree or higher). It is therefore reasonable to assume that this group are aware of the benefits of ICTs. They are also likely to have the skills and ability to use ICTs and were motivated and had sufficient English language capabilities to respond to the postal survey (70 percent of the respondents came to New Zealand under the skilled

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immigrant/business investor/entrepreneur categories which require a very good command of the English language). The study indicates that respondees were "relatively well-off" (p. 11) which makes them more likely to be able to afford their own computers.

Immigrants not in the category of the study's sample, for instance refugees from war-torn countries where education for many citizens is limited and often interrupted, would likely respond differently (if at all). To present a more inclusive picture of ICTs adoption by immigrants other sectors such as the immigrant/refugee population need to be studied.

The Irish study analysed the Community Application of Information Technology (CAIT) project that aimed to encourage ethnic communities and minority groups in Ireland to adopt ICTs. The study also evaluated the outcome of this project focusing on the Africans and Travellers communities and their experience of ICTs. The study argues that a new information economy and network society has emerged in Ireland and that access to ICTs is critical for the inclusion of the country's marginalized immigrant and ethnic minority groups in this new society (Moriarty and Ugba, 2003). The study notes that while the information society bodies, such as the Information Society Policy Unit (ISPU) and the Information Society Commission (ISC), in Ireland have established formal and informal systems of interacting with government departments, businesses, employers and pressure groups, they have overlooked the need to do the same with immigrant and minority ethnic groups. The study emphasises raising ICTs awareness of these groups through channels that are compatible with their way of living.

The Swiss study, aimed at achieving a better understanding of the digital gap that exists between immigrants and the Swiss-born population. The research highlighted some of the problems many immigrants face when they adjust to life in Switzerland where ICTs are part of daily living. Lack of local information, poor literacy, language skills as well as immigrants' cultural background were

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identified as the main barriers that prevent immigrants from adopting ICTs in Switzerland (Chonia, 2002).

These studies contributed to understanding the complex factors for groups concerned with a socially inclusive ICTs environment.

Another area that needs more research relates to the choice of adoption/non adoption of ICTs by immigrants. What motivates immigrants to adopt ICTs and what are the barriers that deter non-adopters? The next section provides a framework for understanding the adoption and non adoption of ICTs and how this applies to recent immigrants.

Rogers' Diffusion of Innovation Framework

Rogers' Diffusion of Innovation (DOI) (Rogers, 2003) theory is a widely used theoretical framework to guide and help in understanding the way through which new innovations are diffused and adopted by individuals. Although this framework is not specific to ICTs, it has been extensively used to guide the theory and practice in the diffusion of new and innovative technology products (Batty, Dobrovolny, Sherry, Ryder, and Wilson, 2002; Rhee and Kim, 2004; Tetiwat and Huff, 2002). According to Rogers, one of the reasons why there is interest in the DOI is because getting a new idea adopted, even when it has obvious advantages, is difficult. This section outlines the Diffusion of Innovation Framework and reviews, other diffusion models which inform adoption and non adoption of ICTs by recent immigrants.

Diffusion Process

Rogers defines Diffusion of Innovation as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, p. 5). Four main elements are described by Rogers as identifiable elements in every diffusion research study. These elements are: Innovation Characteristics, Communication Channels, Time, and a Social System. The next section discusses these four elements.

Innovation Characteristics

The word innovation refers to the perceived newness of an idea or technology product to the potential adopter rather than whether the idea is objectively new. Rogers (1995) states that "If an idea seems new to the individual, it is an innovation" (p. 12). While ICTs have been around for some time, they will be new innovations for some recent immigrants, the target group of this study, who encounter them for the first time.

According to Rogers (1995) there are five perceived attributes of an innovation that influence the rate of innovation adoption. These attributes are:

Simplicity: This attribute describes whether the innovation is perceived to be simple enough to be understood, maintained and used by potential adopters without any complexity.

Trialability: This refers to whether it is possible to try out the innovation on a limited basis, and whether the decision to adopt can be reversed without considerable cost. There is a level of uncertainty in adopting a new innovation. Often potential adopters like to experiment with the new innovation on a smaller scale first before fully adopting the new innovation.

Observability: This attribute refers to whether a potential adopter can see the result of the new innovation and how it affects others before making a decision to adopt it themselves. The ability of observing how a new innovation works is important for the rate of adoption.

Relative advantage: Refers to whether the innovation is perceived to be better than the idea or technology product that it replaces as well as whether there is any economic or social advantage(s) that potential adopters can gain by adopting the innovation.

Compatibility: This attribute refers to whether the innovation is compatible with the potential adopter's values, social norms, needs and belief systems. Ideas that are inconsistent with the values, social norms, needs, past experience and belief system of potential adopters often require a change in the value systems of potential adopters first. This change occurs over a considerable period of time.

For recent immigrants to have a positive ICTs adoption rate, they need to see that ICTs are useful to them, easy to try and simple to use, compatible with their values and beliefs and more importantly give them a relative advantage. Innovations that are perceived to be more complex, are not easily revised, are low in observability, are perceived as inconvenient or irrelevant and are incompatible with the values of the potential adopter, will negatively influence the rate of adoption. The innovation attributes described above are useful as a checklist by both potential adopters and owners of an innovation to anticipate how rapidly an innovation will be adopted. Rogers believes that the more attributes an innovation possesses, the more rapidly the innovation will be adopted.

Communication Channels

The second major element in the diffusion process relates to communication

channels. Communication channels play an important role in the diffusion of an innovation as they enable individuals who are promoting an innovation and potential adopters to share and exchange information regarding the new innovation. The main types of communication channels are mass media, interpersonal channels and interactive communication via the Internet, and are now discussed.

Mass media channels: This refers to a communication mode through which one or a few individuals are able to transmit a message to a large audience using a mass medium, such as radio, television or newspapers. Mass media channels are best used to introduce a new idea or innovation to potential adopters.

Interpersonal channels: These are channels that refer to a communication mode through which two or more individuals are able to exchange messages in a face-to-face setting. These types of communication channels may not be very efficient in introducing a new idea or innovation to a mass audience, but certainly they are very powerful persuasion tools that can be used to convince potential adopters to adopt a new idea or innovation, especially if the individuals communicating have similar socioeconomic and educational backgrounds, interests or beliefs.

Interactive communication via the Internet: This is an emerging mode of communication through which individuals are able to exchange messages using Internet technology.

Time

Time is the third element in the diffusion process. Time affects the diffusion of innovation as it influences the following three areas: the adoption process, innovativeness and adopter categories and the adoption rate.

The Effect of Time on Adoption Process

Rogers (1995) developed a five stage linear model to identify and explain the different stages individuals follow, over a period of time, before they decide whether to adopt or reject an innovation (see Figure 2.3). These stages are:

Knowledge: at this stage an individual (or a group) comes to know about the existence of an innovation, its potential usage and functionality via communication channels. An individual is motivated to actively seek knowledge about an innovation. This involves exploring the advantages and disadvantages of the innovation and results in reducing the uncertainty associated with innovations.
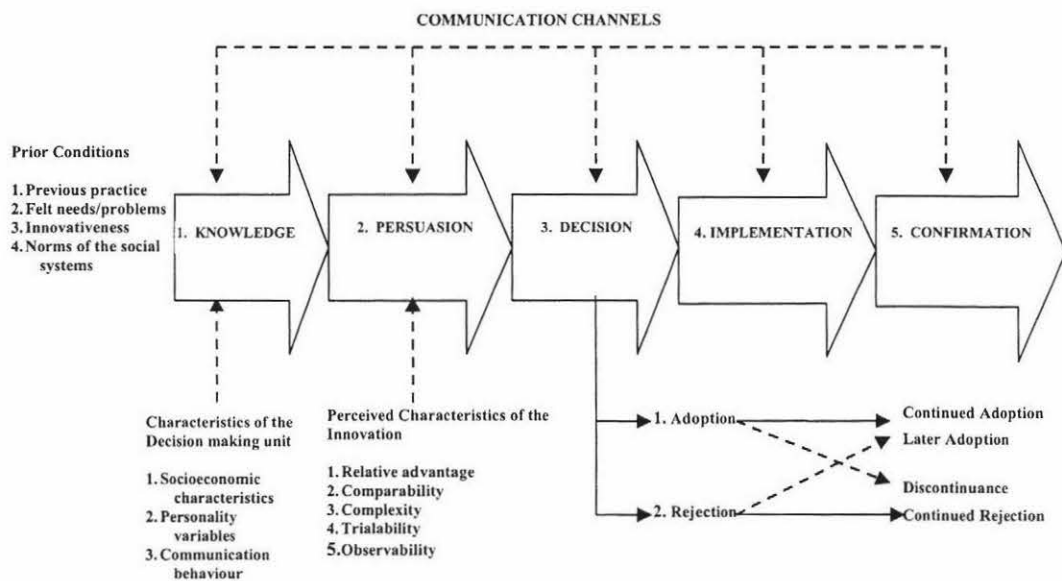
Figure 2.3. A model of five stages in the innovation-decision process.
Note: From Rogers (2003, p. 170)

Persuasion: at this stage an individual (or a group) formulates their own idea about the innovation. Potential adopters create an either positive or negative attitude or image about the innovation. At this stage the perceived characteristics of innovation described earlier (Simplicity, Trialability, Observability, Relative advantage and Compatibility) will greatly shape the individual's attitude towards the innovation.

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Decision: at this stage an individual (or a group) decides whether to adopt (make full use of the innovation) or reject (not to adopt the innovation) based on the knowledge gained and the attitude or image formed about the innovation by potential adopters. The decision to adopt or reject an innovation can be reversed at a later stage. Individuals who decide to adopt an innovation can both continue the adoption and proceed to the implementation stage or they may decide to reject an innovation that they have adopted at an earlier stage (known as 'Discontinuance'). On the other hand individuals who decide to reject an innovation at an earlier stage may either continue to reject the innovation or decide to adopt it at a later stage creating what is known as 'Later Adopter'.

Implementation: once individuals decide to adopt an innovation the implementation stage begins. At this stage individuals actually start using the new innovation. An individual's usage of an innovation can lead to some changes or modifications to the original innovation (Reinvention) during the adoption process.

Confirmation: at this stage an individual (or a group) evaluates the use of an innovation, looking for evidence to support the continued use of the innovation. If the evaluation is negative, the individual reverses the decision to adopt.

Adopter Distribution over Time

According to Rogers (2003) individuals can be classified into five types in terms of the degree of relative acceptance of an innovation over time. The types are: innovators, early adopter, early majority, late majority and laggards (see Figure 2.4).
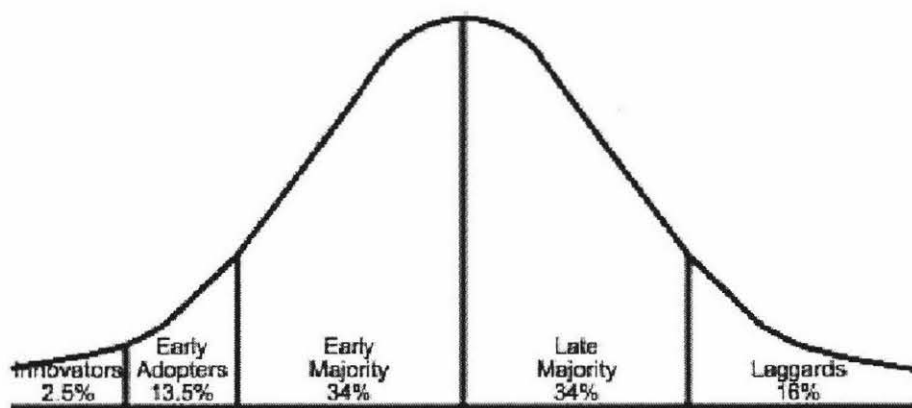
Figure 2.4. Adopter categorization based on innovativeness.

Note: from (Rogers, 2003, p.282)

Rogers observed that in a given population 2.5 percent are eager to try new ideas (innovators), 13.5 percent are opinion leaders (early adopters) who are generally respected by their peers/community, 34 percent are reluctant to adopt an innovation until most other people in their organisation or social circle have done so and 16 percent are traditional individuals and tend to be suspicious of innovation and change, preferring to follow traditional approaches.

Adoption Rate over Time

This refers to the relative speed with which members of a societal group adopt an innovation. The rate of adoption is measured by calculating the time required for an innovation to be adopted by a certain number of a potential adopter's population. Rogers observed that most innovations have an S-shaped rate of adoption.

Social System

Social system is the fourth element in the diffusion process, and is defined as

a group of entities that are faced with similar problems and working towards a common goal. For most members of a social system, the innovation decision depends heavily on the innovation decisions of the other members of the system.

This section has described the main elements of the Diffusion of Innovation Theory proposed by Rogers to explain how individuals and groups adopt new ideas or new technology products. Rogers' work has generated considerable interest among the research community interested in the diffusion of innovation research. His diffusion of innovation theory is regarded as a major milestone in this area. While it has been realized that there is a very large body of literature based on Rogers' work across disciplines, the next section summarises the major extensions to the DOI as well as the major alternative research models that attempt to explain the diffusion process.

Beyond the DOI Framework

Kwon and Zmud (1987) suggest that the implementation of information technology might be studied more effectively by combining the DOI model with application implementation research resulting in a more comprehensive model which includes Task characteristics (uncertainty, autonomy, and variety) and Environmental characteristics (heterogeneity, uncertainty, competition, concentration/dispersion, and inter-organisation interdependences). They also propose a different way of defining the process of innovation to include post implementation phases; these changes have been included in numerous research studies.

Rogers' Diffusion of Innovation Theory (DOI) has been critical in providing insight into the adoption, implementation and diffusion of innovation in

general. Nevertheless, researchers into complex organisational technology, and intra-organisational information systems, have criticised the deficiencies of the DOI theory in explaining the adoption behaviour (Fichman, 1992; Brancheau and Wetherbe, 1990). Prescott and Conger (1995) state that Rogers' traditional DOI model needs to be modified "... when applied to inter-organisational systems" (p. 32) because the five general attributes, relative advantage, compatibility etc, that are used to explain potential adopters behaviour alone many not be sufficient to help understand the adoption behaviour of a complex organizational technology

One of the major alternative models to the DOI is the Theory of Planned Behaviour (TPB) developed by Ajzen (1985) to study people's intention to adopt innovations. This theory has been derived from the Theory of Reasoned Action (TRA) developed in earlier work by Fishbein and Ajzen (1975). This theory suggests that individuals would use computers if they could see a positive outcome of using them. Brown and Venkatesh (2005) used the TPB as their base framework to develop a Model of Adoption of Technology in Households (MATH) which focuses on adoption of technology in the household.

Another diffusion model adapted from TRA is the Technology Acceptance Model (TAM) developed by Davis (1989). TAM explains the factors that shape or affect a user's attitude and hence the user's behaviour towards using information systems. TAM suggests that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are the main variables that affect system usage along with some other external variables (see Figure 2.5).

However, Gallivan (2001) argues that traditional innovation adoption theoretical frameworks such as DOI (Rogers, 1995), TRA (Fishbein and Ajzen, 1975), TAM (Davis, 1989) and the extended TAM (Davis, Bagozzi, and Warshaw, 1989), TPB (Ajzen, 1985) do not address the implementation and adoption of technological innovation when adoption decisions are made at the

organisational level. Rather Gallivan maintains that the traditional frameworks concentrate on the adoption decisions at the level of individuals. Thus he suggests that there is a need for modification of these models or even the development of entirely new ones.
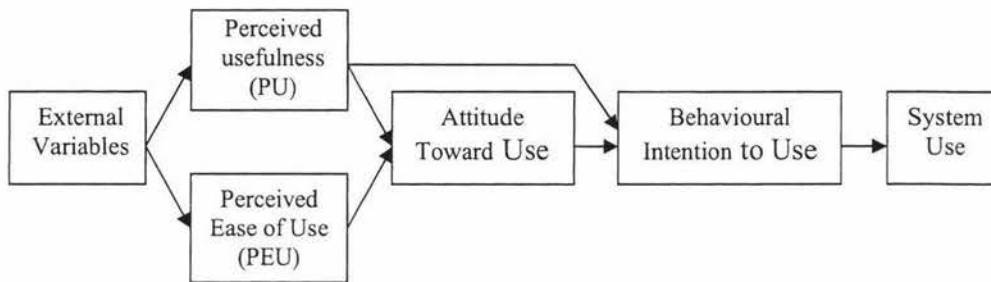
Figure 2.5. The Technology Acceptance Model (TAM).
Note: From Davis (1989)

The additional work since Rogers' original DOI framework is useful for specific environments, such as organisational settings. However, the original framework, together with Warschauer's ICTs for Social Inclusion Framework, are relevant and suitable for this recent immigrants' study. The major elements of the Diffusion of Innovation Theoretical Framework - innovation characteristics, communication channels, time, and social system – are useful for understanding the adoption/non adoption choices. These elements are appropriate for use in understanding the adoption/non adoption of the ethnically-diverse immigrants' community involved in this research and will help towards understanding the motives and the processes through which potential adopters progress.

Summary

This chapter has reviewed the digital divide literature and the barriers to ICT adoption by societal groups. Research on ICTs for social-inclusion has been discussed and Warschauer's framework presented as a model that facilitates adoption, particularly for underserved people. The immigrant literature explores the challenges facing new migrants and the importance of ICTs as a facilitator in their re-settlement process. Finally Rogers' Diffusion of Innovation Framework is presented, along with alternative models that have built on Rogers' work. These theories provide the theoretical framework for this qualitative study that seeks to understand ICT adoption and non adoption by recently-arrived immigrants to New Zealand, many of whom are from developing countries. The next chapter presents the research design and describes the methods used in the qualitative approach taken in this research.

CHAPTER 3

RESEARCH METHODS AND DESIGN

This chapter starts by stating the research objectives, followed by a background to research methods. Then the chapter presents a discussion on the research method, the sample selection and the data collection approach used in this study. This is followed by the description of how the interviews were conducted and the ethical issues. The chapter concludes with an overview of the data analysis.

Research Design

This research investigated the adoption and non adoption of ICTs by recent immigrants in the Wellington region. The research objectives are to:

1. understand recently-arrived immigrants' perceptions of ICTs,

2. examine the factors that influence immigrants' adoption and non adoption of ICTs,

3. understand the process followed by recently-arrived immigrants when adopting ICTs, and

4. make recommendations, where appropriate, to assist in promoting ICTs usage among the immigrant community.

While the focus of this study is on the adoption and use of computers and the Internet, the participants are asked about their adoption of other communication devices, for example cell phones, Personal Digital Assistant (PDA), etc.

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Background: Research Approaches

There are two main approaches widely used in research; qualitative and quantitative (Patton, 1980; Phillips, 1987). The quantitative approach, originally developed for the natural sciences, is used to study a phenomenon by taking a sample from a general population to test the validity of a set of predetermined questions using mathematical models and statistical tables. This approach is said to emphasise the neutrality of the researcher as well as providing a clear separation between the researcher and the subjects being researched (Denzin and Lincoln, 1998). On the other hand, the qualitative approach, originally developed in the social sciences, is used to study a phenomenon in its natural context using detailed interviewing and observation techniques. In this approach the researcher(s) has/have an interactive role to play in the research process. The main difference between the two approaches therefore is one of focus. Quantitative research is concerned with the measurement and analysis of causal relationships between variables, whereas qualitative research emphasises processes and meanings.

Information systems researchers have identified a number of factors that can influence the selection of a particular research approach. It has been reported that the nature of the study's topic, the research objectives and the study's context are among the factors that researchers need to consider when selecting an approach (Benbasat, Goldstein, and Mead, 1987; Galliers, 1992; Jenkins, 1985). Creswell (1994) argues that there are five main criteria affecting the selection of a research approach. These are: the researcher's worldview, training and experience of the researcher, the researcher's psychological attributes, the nature of the problem and the audience for the study.

When considering the approach to use for this study the decision was informed by Creswell's (1994) evaluation of the assumptions inherent in these

approaches. He states that the qualitative approach assumes that first, research is conducted in an informal relaxed environment; second, using the qualitative approach allows the participants to be heard; third, using this approach allows the researcher to interact with the research participants. These factors and assumptions influenced the adoption of the qualitative approach for this immigrants and ICTs study. The qualitative approach affords a richer understanding of the immigrants' ICTs adoption process. This is especially important as the participants are mostly refugees from developing countries who would be unlikely to participate in a survey and for whom gaining an in-depth understanding would be almost impossible. The informal nature of the qualitative approach allows people from different sectors of the immigrant community to be heard, regardless of the level of their English language skills, employment status and educational background. The use of other research approaches such as a postal questionnaire could potentially lead to the exclusion of a significant number of the recent immigrant community because of their poor English comprehension and reluctance to participate in what they may see as a formal requirement. The refugees and immigrants who participated in this study are predominately from oral societies. It is common in these societies that people are more open and comfortable in engaging in an informal conversation than answering written questionnaires (Malmgren, 1999).

Sample Selection and Description

The target population of this research project are recently-arrived immigrants living in the greater Wellington area in 15 households. The researcher initially met with one interested person from each household but when the interviews were held in the immigrants' homes other family members were present and contributed to the discussion. The sample, therefore, is 32 recent immigrants aged between 12 and 65 years. They came from developing countries that

include Africa, the Middle East, Central Asia and South East Asia. It is recognised that there are country differences within these broad regional categories but for the purpose of this study, the Statistics New Zealand categories have been adopted. Some of the interviewees have experienced war-time trauma, some have come from repressive regimes, and they have varying English-ability levels that range from limited knowledge to fluent English. Table 3.1 reports the number of household participants (32) and the gender composition of the sample from each region (17 female and 14 male). Most of participants are from Africa (12), followed by nine from the Middle East.

Table 3.1

Numbers and Age of Participants from the Four Regions

Region of Origin	Number of Households	Gender	
		Female	Male
Africa	6	7	5
Middle-East	4	5	4
Central Asia	3	3	4
South East Asia	2	2	2

Because of the large amount of data that is gathered through the face-to-face interviews, a sample size of 32 from 15 households is considered appropriate for this research. Todd and Benbasat (1987) state that due to the large volume and high intensity of data generated using "verbal protocols", which include semi-structured interviews, sample sizes are commonly small (between 2 and 20) and satisfactory for qualitative research studies.

The sample is considered to be reasonably representative of immigrants from developing countries living in the Wellington region, as over 25 percent of the

total immigrant population in that region are from these countries (Statistics New Zealand, 2002a).

Interviews

Interviews are "a conversation with a purpose" (Kahn and Cannell, 1957, p, 43) and are used in "attempts to understand the world from the subjects' point of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations" (Kvale, 1996, p. 1). Similarly, Patton (1980) describes the purpose of qualitative research interviewing as the act of finding out what is on the interviewee's mind. He categorises qualitative research interviewing into four main types: informal conversational interviews, general guided interviews (semi-structured), standardised open-ended interviews and closed, fixed response interviews. Interviewing enables the researcher to collect a large amount of data quickly (Marshall and Rossman, 1995), allowing the researcher to seek new insights and to examine a phenomenon in a particular context (Robson, 2002). The successful use of qualitative research interviews greatly depends on the participation of the interviewees and their willingness to share their information and views with the researcher. To enable effective participation, qualitative interviewing commonly involves a small number of participants (Todd and Benbasat, 1987).

Semi-structured, in-depth interviews were the main data collection method used for this study as they first, allow the researcher to systematically collect a large amount of data from the interviewee while maintaining some sense of informality and keeping the interviews conversational. Second, the use of semi-structured interviews allows the topics and issues to be specified in advance, in outline format, thus freeing the researcher to decide the sequence and wording of the questions in the course of the interview (Patton, 1980). Additionally data was collected from secondary sources such as census data and the Refugee and Migrant Services (RMS) publications as well as

information provided by ethnic community leaders. This is related to the different cultures and country infrastructures and background of the participants.

These semi-structured interview characteristics are important for this research because many of the participants come from disadvantaged backgrounds and have had negative experiences. The researcher could follow the outline questions and yet be responsive to the interviewees and change sequence and wording of questions when necessary. The informal conversational nature of the interviews gave interviewees a chance to freely share their ICTs experience without being constrained and limited to answer standardised wording of questions. However, the format still permitted the researcher to collect systematic and comprehensive data. The semi-structured interviews also allowed the researcher to carefully decide how best to use the limited time available and as Patton (1980, p. 283) notes are "especially useful in conducting group interviews" as they allowed each member of the group to express their views on, and experience with ICTs but kept the interaction focused at the same time. Finally, this approach allows the researcher to probe and guide interviewees, when needed, to make sure that all topics on the outline were covered.

Because the conventional one-off, professional interview is considered unsuitable for vulnerable social groups (Russell, 1999) two rounds of semi-structured interviews were used for this study. This enables the researcher to form a relationship with the participants thereby allowing any feelings of trepidation and anxiety about the interview process (which would have been a foreign experience to many of the refugees) to be mitigated. It also provided the opportunity for the study's purpose to be explained and questions to be answered. The development of the interview questions for this study was guided by Rogers' Diffusion of Innovation (DOI) theory and the literature related to diffusion of innovation.

Reliability and Validity

Cooper (2001) states that a well designed qualitative research study is reliable and valid through using a number of different strategies. These involve collecting data at various times, in different spaces and from a number of different sources. Multiple sources in this study included the community leaders who facilitated the contacting of potential participants and sometimes joined the interviews, data from New Zealand Statistics Department as well as the multi-ethnic composition of the sample. Thirty two household participants from different countries and backgrounds were interviewed twice in different timeframes in their homes. This provided triangulation on different sources, which involved data, time and space, thus contributing to a reputable research design.

To mitigate interviewer bias, identified by Robson (2002) as potentially affecting the dependability of interpretation, the interview transcripts were returned to the participants who were invited to read them and discuss any changes they wished to make. This served three purposes. First, it ensured that the information provided in the first interview was verified as authentic, reliable and accurate and represented what the interviewee intended. Second, it empowered the interviewee to become more than a passive responder to questions. The opportunity was afforded the interviewee to expand, correct and discuss and this had a positive effect on the interactions that occurred during the second interview. Establishing a positive relationship of trust and acceptance between a researcher and the research participants has been noted as essential for effective studies (Mun Wong, 1998; Sword, 1999). Third, the researcher is an immigrant from a continent many of the participants originated from and therefore has an understanding of some of the experiences that the interviewees would have undergone. Researchers who have experience in common with those they interview form a closer relationship, further contributing to the trust between the study's participants (Kleinman and Copp, cited in Jarzabkowski, 2001) .

The need to establish credibility with the study's participants is important. Keegan, Legard, and Ward (2003, p.14) state that "asking relevant questions which are seen as meaningful by the participant and which are based on an understanding of the research subject" (p, 14.) contributes to the reliability and validity of the research. Interview questions were developed based on the researchers' knowledge and understanding of the literature. They were also informed by the literature on the digital divide especially as it related to under-served communities. At the interview questions were asked (and sometimes explanation given) in a context that the interviewees understood.

Ethical and Cultural Considerations

As the study involves participants from different minority ethnic groups, most of whom speak English as a second language, it was important that cognizance be given to ethical considerations. Application for ethical approval was made to, and granted by, Massey University Human Ethics Committee (MUHEC) for this study (see Appendix 01, MUHEC Approval). The researcher adhered to the ethical principles of the Code of Ethical Conduct for Teaching and Research Involving Human Subjects produced by the university in 2004. This involved respect of all participants, informed and voluntary consent being obtained and participants being assured of confidentiality and anonymity of their identity in the reporting of results. The researcher was aware of social and cultural sensitivity issues relating to the age, gender, culture, religion and social class of the participants. These issues were considered and informed the interviewing conventions. In addition, the researcher was conscious of observing in a respectful manner the societal mores and norms of the participants (for example, removing his shoes before entering their homes).

Informed Consent, Anonymity and Confidentiality

The Director of the Wellington branch of the Refugee and Migrant Services (RMS) and ethnic community leaders agreed to support the study by facilitating contacts with members of the recent immigrant and refugee community. At times some of the community leaders attended the interviews at the interviewees' request.

An information Sheet explaining the aim, objectives of the research project as well as the rights of potential participants was given and discussed with the community leaders prior to the first interview (see Appendix 02, Information Sheet). The community leaders agreed to personally give this Information Sheet, with an explanation of the aim and objectives of the study to the potential participants prior to the first interviews.

All household participants were given a consent form (see Appendix 03, Consent Form), and after reading it and agreeing to participate in the study they nominated a member to sign the form and returned it to the researcher.

When the researcher first met the interviewees, and after the study's aim and objectives were explained, it was made clear to all participants that they had the right to the following: first, they could decline to participate; second, decline to answer any particular question; third, withdraw from the study at any time; fourth, ask any questions about the study at any time. Confidentiality was a major issue in this study and assurances were given that published results would not identify individuals. All interviews were audio-taped (see the Data Collection section presented later in this chapter for details). The audio-tapes were transcribed by the researcher and these, together with the signed consent forms (signed by the nominated interviewee), would be kept in a secure locked cabinet for five years. The identity of all participants was

protected by assigning a code to each household participant's set of responses.

Cultural Consideration

The researcher is an immigrant from Africa and because of his multi-ethnic experience, due to living in different countries, the researcher was sensitised to different cultural norms and mores. This experience informed the researcher's conduct and behaviour during the interviews. The researcher was aware that for some participants it is not culturally acceptable to have eye contact, particularly with female participants, during the interview. When sensing unease the researcher made the participants comfortable by addressing the male participant present in the interview. Occasionally the participants had visitors while interviews were taking place. When that happened, the researcher would immediately stop the interview to allow the participants to greet the visitors and wait for the participants to decide whether they wanted to continue the interview or wait until the visitors left. The researcher was conscious of participants' time constraints during the interviews and made the timeframe clear before beginning the interview. Observation of these cultural conventions thus enabled the researcher to establish connection and trust with the participants and helped the interviewees to be more relaxed and spontaneous during the interviews.

Data Collection

This section describes the development of the interview questions and the process used to conduct the interviews. Then, the ethical issues relating to

privacy, confidentiality and research participants' selection are discussed.

Before the data collection started, the interview questions were cognitively tested in pilot interviews with some of the community leaders. The leaders were recent immigrants who shared many of the settlement experiences of their cohort. The researcher noted any difficulties in understanding and comprehending the questions as well as noting the time taken for the pilot interview. The aim of this trial was to ensure the cultural acceptability of the questions by the community leaders and take advice on any inappropriate or culturally unacceptable questions. Furthermore, the pilot was intended to give the community leaders an understanding of the project and a chance to experience the interviews. As the community leaders were helping to publicise the study to their own people, it was important to secure their interest in the project and for them to be cognizant of the research design and the interview questions. Once the revisions had been made to the semi-structured interview questions, they were again discussed with the community leaders and finalised, bearing in mind the leaders' input (see Appendix 04, Interview Questions).

The leaders then contacted their community members and explained the aim, objectives of the study, as well as the type of interview questions that potential participants would be asked. Once a potential household participant had been identified and had agreed to participate in the study, the community leader passed their contact details to the researcher. The researcher telephoned each participant to ask them about a convenient time and place for the first interview. The main interviewee was the householder who was originally contacted and had agreed to the meetings. However, as the interviews were held in the participants' homes, they were often joined by other family members who contributed to the interview. All interviews took place at the participants' homes (at their request), and interviews took between 40 to 60 minutes. The researcher kept a log of all communication made with potential participants.

As stated earlier, the aim of the first round of interviews was to establish trust with the participants and to explain the study's aim and objectives. The researcher explained the interviewee rights, the participants were asked whether they agreed for the interviews to be audio-taped and a consent form was signed by one family member. All participants agreed to the audio-tape and signed the form.

The interviews took place in the living area at the participants' homes. Because of the different cultures, religion and educational backgrounds the gender composition of the participants varied by household. Some were all-male interviewees who spoke on behalf of their female relatives. At other households there were often both male and female interviewees who contributed equally, taking turns to answer questions and share their experiences and views regarding ICTs. The ages of the participants varied from 12 - 65 years old. Younger members of the households were noticeably more active in sharing their views during the interviews. This can be attributed to their better English language ability and confidence in their ICTs skills. Occasionally they interpreted for other members of the household. The final question invited the participants to ask the researcher any questions before he left.

The first interviews were transcribed within six weeks from the meeting. Then the researcher contacted the participants to establish a mutually agreeable time for the second interview when the transcript of the first interview was returned for discussion and verification.

The second interview was a follow up of the first interview and provided an opportunity for both the researcher and the participants to validate the transcribed interviews as well as allowing further discussion on their ICTs adoption and/or non adoption. When the researcher arrived he accepted a

cup of coffee or tea and during this time of hospitality the transcripts were given to, and read by the participants. The reading was interrupted by affirming comments and sometimes the participants expanded on the earlier comments with additional information. The principal interviewee and most of the household participants who attended the first interview were present for the second meeting. The second interview proved to be a useful strategy because participants were more relaxed and spontaneous than in the first. At the conclusion of the second interview the researcher thanked the participants for their time and hospitality. Where the data of the second interview further informed the first interview, this was transcribed into the appropriate places in the original transcribed file. The participants were encouraged to contact the researcher should they have any questions or concerns about the study and advised that a summary of the research would be provided to their community leaders.

Overview of Analysis

The challenges in the analysis of semi-structured interview data include making sense of large amounts of data, reducing the volume of information, identifying significant patterns, and constructing a framework for communicating the essence of what the data reveals (Patton, 1980). To reduce the complexity of managing the data collected from the two rounds of interviews involving 15 household participants the qualitative software QSR N6 was used (QSR, 2002)

The typed verbatim transcripts of the 15 audio-taped household interviews were first imported into the computer program, enabling the researcher to effectively and efficiently code, organise, sort and store the interview data into the program database.

The data was examined looking for patterns and themes. When a pattern or theme was identified, codes were assigned to units of meanings or *text units* (QSR N6 term for specific chunks of data) creating *free nodes* (text units created in QSR N6 to capture the ideas present in the data). As the transcripts were read and re-read more themes and patterns emerged. The surfaced themes were grouped, based on the participants' responses, into different categories and organised in *tree nodes* (QSR N6 term for text units organised hierarchically to represent categories and subcategories). This process has resulted in identifying five major categories and subcategories (see Appendix 05, Interview Categories and Themes).

An inductive analysis approach proposed by Patton (1980), in which the patterns and themes of analysis come from the data, was used to guide the data analysis for this study. Individual household data were examined, evaluated and compared with other household data to elucidate key phrases or terms used by the participants in the interviews. Rogers' DOI framework described in Chapter 2 also informed the analysis. The data was then organised and presented in categories and sub categories according to these key phrases or terms.

QSR N6 not only enabled the researcher to perform text[2] and node search[3], but also provided for the documenting of interviewee name, date and time of the interview, pseudonyms, etc. This provided the ability to drilldown and contextualise the quote or paragraph after searches were run. Crump (2002) notes that the contextualising of qualitative data is important and relevant because it allows for a better understating of the data and means of validating analytical claims.

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[2] Used to find all instances when a word or phrase is used
[3] Used to examine patterns in occurrences of nodes through the documents in order to reveal relationships, patterns, links, nuances and new dimensions in the text

Summary

This chapter described the research approach used for this study as well as the validity and reliability of qualitative research studies. The sample selection process and description was discussed and the semi-structured interview method used for data collection has been discussed. The need for, and steps taken, in consideration of ethical and cultural issues were then presented. The next chapter reports the analysis and results of the qualitative interviews.

CHAPTER 4

ANALYSIS AND RESULTS OF
THE QUALITATIVE INTERVIEWS

This chapter reports the interview data gathered from the participants of 15 households who were involved in this study. The chapter starts by describing the environment in which the interviews took place. This is followed by the presentation of the interview results organised under categories which are based on the patterns and themes identified in the interview transcripts. The chapter concludes with a summary of the findings from the interviews.

Background

The Refugee and Migrant Service (RMS) Wellington branch representative supported the data collection for this study by organising access to potential volunteer participants from the immigrant community in Wellington. As mentioned in Chapter 3, the RMS representative agreed to provide access to different community leaders and their contact details (permission for which had been previously granted by the potential participants) as well as access to refugees and immigrants who are in contact with the RMS. The community leaders, in turn, provided the researcher with the names and contact details of the volunteers who had expressed interest in participating in the study. After the initial meeting with the participants formal agreement was obtained and the consent form signed.

Participants in the study are from the greater Wellington area which includes Wellington City, the Porirua area and the Hutt Valley region. Two rounds of

semi-structured interviews took place at the participants' homes. The interviews were conducted with 32 immigrants in 15 households, being the target sample. The total number of interviewees was 32 individuals with an average of 2.1 members per household present, most of whom contributed to the interview discussion.

Approach to Interview Analysis

The data from the interviews comprised 15 transcripts totalling 21 single-spaced A4 pages. The semi-structured interview questions provided the basic structure to the interview data analysis (see Appendix 04, Interview Questions). These questions focused on issues relating to ICTs adoption and non adoption identified in the literature and Rogers' theory of DOI. Analysis of the transcripts was aided by the qualitative data analysis tool QSR N6 version 6.0.

The transcribed interview data was subjected to three separate rounds of coding in line with that described and recommended by Strauss (1987). This approach resulted in a comprehensive understanding of themes and identified patterns in the data. The analysis involved preparing and coding of the transcripts before importing them to QSR N6. The coding was informed by Miles and Huberman's (1984) suggestion of assigning codes to units of meanings. These 'units' could be "chunks" of varying size - words, phrases, sentences or whole paragraphs.

On the first round the transcripts were analysed looking for key patterns and themes. Once identified, they were assigned initial codes. For example, the code '1' indicated the theme 'Adopter'. The themes in the data were identified based on the research questions and the relevant ICTs adoption literature.

While Miles and Huberman (1984) suggest that the researcher should begin the coding with a predefined list of concepts that informs the themes categorisation, other researchers suggest that the first round of coding should be undertaken with no preconceived concepts (Glaser and Strauss, 1967). The approach advocated by Miles and Huberman was adopted in this study because themes had already been identified from the ICTs literature. However, this did not limit an open interpretive approach based on the data. Where data did not 'fit' the literature and rather 'initiated' new ideas and themes (Greene, Caracelli, and Graham, 1989) these were then coded.

Once the first round had been completed, a second one was conducted beginning with the organised set of the initial codes. This provided an opportunity for reflection on the themes and patterns identified and resulted in additional themes being added. The data was then subjected to a third round of coding affording final reflection. During this process both the data and previous codes were scanned for cases that matched the themes or patterns identified earlier in the first two rounds of coding. The cases that matched previously identified themes or patterns were compared and contrasted with each other in order to complete the identification of the major themes. This hermeneutic approach allowed the researcher to ensure that all available themes and patterns in the data were uncovered and reported accurately.

The identified themes have been organised in a hierarchical structure (see Appendix 05, Interview Categories and Themes). This process has resulted in identifying the five major themes of: Immigrants' Perceptions of ICTs, ICTs Access, ICTs Usage, Motivation and Internet Content in Immigrants' Language. Only one level was identified for the theme Internet Content in Immigrants' Language.

The next section reports the interview results presented under the major themes and sub themes, with quotes representing the participants' responses to the interview questions.

Interview Results

The results show that among the 32 individual participants from the 15 households, 19 identified themselves as adopters and 13 stated that they were non adopters. For the purpose of this study, householders are classified as adopters or non adopters on the basis of their ICTs usage (or not) and regardless of their skills level, type of usage and ICTs experience. Householders were classified as adopter if any member of a household replied 'Yes' to any of the interview questions: "Do you use computers? Do you use the Internet?" When householders answered 'No' to all of the previous questions then they were classified as non adopter.

Table 4.1 shows that of the 17 female participants, nearly half (8) were adopters, compared with 15 males where the majority (11) were adopters. The results also show that among the 32 interviewees there were 13 non adopters, the majority of whom (9) were females. Five of these female non adopters had no educational background at all. These results suggest that male immigrants were more likely to adopt ICTs than their female counterparts. Table 4.1 also shows that five of the interviewees, (3) females and (2) males, over the age of 45 stated that they were non adopters, the majority of who (4) had no educational background. These results also indicate that both age and education are influencing this groups' ICTs non adoption

The next section reports the interview results focusing on the participants' perceptions of ICTs. Comments made by the participants are presented and pseudonyms have been used.

Table 4.1

Participants' Adoption Status, ICTs Access, Gender and Age

Household	Participant	Adopter?	Access at home	Gender	Age	Educational background
1	a	Yes	Yes	M	23	Secondary School
	b	No		F	19	None
2	a	No	No	M	48	Primary School
3	a	Yes	No	M	14	Primary School
	b	Yes		F	12	Primary School
	c	Yes		M	17	Secondary School
	d	No		F	21	Secondary School
	e	Yes		M	29	Secondary School
	f	No		F	48	Primary School
4	a	No	No	M	65	None
5	a	Yes	Yes	F	18	Secondary School
	b	Yes		F	48	Tertiary
	c	Yes		M	49	Tertiary
6	a	No	Yes	F	24	Primary School
7	a	Yes	Yes	M	29	Tertiary
8	a	No	No	M	32	Primary School
9	a	No	No	F	37	Secondary School
10	a	Yes	Yes	M	19	Secondary School
	a	No		F	22	Primary School
	b	Yes		M	17	Secondary School
	c	No		F	56	None
11	a	Yes	Yes	F	39	Tertiary
	b	Yes		M	43	Tertiary
12	a	Yes	Yes	M	19	Primary School
	b	Yes		F	16	Secondary School
	c	Yes		F	17	Secondary School
	d	Yes		F	21	Secondary School
	e	No		F	62	None
13	a	No	No	F	24	None
14	a	No	No	M	62	None
15	a	Yes	Yes	F	29	Tertiary
	b	Yes		M	44	Secondary School

Immigrants' Perceptions of ICTs

The majority of interviewees were very enthusiastic about their use of ICTs and for the non adopters, the potential benefits that ICTs could afford them. As reported in Chapter 2, it has been established in the technology adoption literature that the perceived attributes of innovations, individual socioeconomic characteristics and innovation characteristics are among the main factors that determine an individual's adoption (Rogers, 1995). The results show that participants were positively influenced by these attributes and characteristics as well as other factors. The next section presents the interview results organised under three major themes relating to the participants' perceptions of ICTs. These themes are Perceived Usefulness, Perceived Ease of Use and Perceived Importance.

Perceived Usefulness

All participants who identified themselves as adopters or non-adopters were asked: "What do you think are the benefits of using computers and the Internet?" This was followed by: "What do you think computers and the Internet will enable you to do in the future?" The participants' responses overall were positive. They perceived computers and the Internet as useful to them (see the ICTs usage section for details on what use the participants made of computers and the Internet). Two Somalis expressed their view about the usefulness of computers

> Computers make everything easier. I didn't know much about them [computers] when I started in 2001. Now I know a little bit and I am learning more about them [computers] every day. (Ismail, Somali, M, 23)[4]

> The computers will be able to do every thing for you in a couple of years' time. Anything you want, the computers will be able to do it for you. (Fawzia, Somali, F, 24)

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[4] The bracketed data indicate the participant's name (a pseudonym), country of origin or region, gender, age in years. Some interviewees requested their country was not named but agreed the region could be identified.

Similarly, Nawal thought highly of computers and the Internet, observing the convenience of access to information and communication facilities provided by the Internet

> Computers make life easier; you've got everything you wanted there. (Nawal, Middle Eastern, M, 32)

Somia who started using the Internet nine months prior to the first interview, reflected globally when she stated that

> The Internet might be able to convert the whole world to an online one. (Somia, Iraqi, F, 19)

Recognition that not everything associated with the Internet was viewed as positive is indicated by an adopter Iraqi mother who commented on her daughter's positive views about the Internet. She said that

> ...at the same time it [the Internet] is very bad for children. You don't know what they can access or do on the Internet. Not everything is useful in the Internet. (Nireen, Iraqi, F, 48)

As a result Nireen decided to limit the number of hours her children spend on the Internet and actively monitor their activities online.

Perceived Ease of Use

Some of the participants perceived computers as hard to learn and use with Salwa commenting on their complexity and identifying memory as important.

> It is too hard. I find it hard to remember how to operate them. (Salwa, Somali, F, 56)

The need for assistance from friends was recognized by Loui

> It was hard and frustrating [learning about computers], you can't call your friends to help you out all the time. (Loui, Kenyan, M, 48)

The younger immigrants, or those with higher educational achievements, indicated that it was easy for them to learn and use computers. The majority

were male immigrants with Hassan's comment being typical of the group's responses.

> When you learn about computers it is like learning about TV or any other device. It is easy. (Hassan, Iraqi, M, 17)

Perceived Importance

The interview results show that many immigrants perceive knowing about computers as important, especially when looking for jobs in New Zealand. When responding to the question "What made you decide to use computers and the Internet?" Nila explained why she believed computers were important

> I found that computers are very important. When you are looking for a job, they are always asking for computer skills. (Nila, Middle Eastern, F, 39)

This view was shared by her husband

> This is the same for me and that was Work and Income advice. They told us to get a job, you must know something about computers and that is why we've been doing some computing courses and studies; they are very important. (Eimad, Middle Eastern, M, 43)

Even for one of the non adopter participants the importance of computers has been highlighted through her personal experience of trying to find a job

> Computers are very important. I applied for a checkout position at the supermarket; I could not get it [the position] because I don't know how to use computers. Computers are required for jobs everywhere here in New Zealand. (Asmelesh, Ethiopian, F, 22)

When asked if she would consider using or learning computers in the future, she expressed her interest in doing so but had no firm plans.

ICTs Access

Discussion that resulted from the questions: "What made you decide to use computers and the Internet? Do you have access to computers at home? Where do you access computers?" resulted in the four sub themes of Computer Access at Home, Educational Background, Age and Gender, Language, and Computer Skills relating to access.

Computer Access at Home

The desire to have access to computers and the Internet at home was evident from all the participants' responses; both adopters and non-adopters. Eight of the 15 households had a computer at home (see Table 4.1). The results show that nearly all participants who identified themselves as adopters had computer access at home. The exception was for household number three where there was no home access but four of the six participants were adopters. The participants in household number three stated that they access computers at school. The number of households who had computers at home was rather surprising given that the majority of the participants were recently-arrived immigrants with a refugee background, and were either unemployed or studying. This suggests that the participants viewed having a computer and Internet connection at home as a priority.

One of the reasons given for placing such a high priority on access in having a computer at home is related to the children's need to access computers to do school work. This is illustrated by IKbal's comments

> Computers cost a lot of money, but we had to buy one because when my kids started school they need to do reports and research and it had been difficult for them to go to the library and spend some time to do it, so from that stage I thought it will be better to buy a computer. This way they can spend more time at home with me. (Akbal, Middle Eastern, F, 44)

This view was shared by Nena, she indicated that

> We bought the computer for the sake of our daughter. It is very hard to
> find any educational materials in our language [Hindi] in the public
> library. Now we can access websites in Hindi and download stories and
> stuff for her. (Nena, Indian, F, 29)

These responses show that there are cultural constraints, particularly for
female members of some immigrant households. For example the restriction
on females, from some cultures, using public facilities such as libraries for
extended periods of time (such as female students using the computer for
school research) is discouraged. This was highlighted by Sanjeeve who said

> Females can't go out of home as much as male can go. For example
> my brother can go to a computer place and stay up to 10 or 11 pm that
> is easy, but my parents wouldn't allow my sister to go and learn
> computers out of the house that late, especially if she has to travel few
> kilometres. (Sanjeeve, Indian, M, 36)

One male participant indicated his freedom from such constraints when he
stated that he uses an Internet café to access computers and the Internet

> Because we do not have a computer at home and we do not have
> access to the Internet at school so we have to go Internet café or
> somewhere else to access the Internet. (Khalied, Pakistan, M, 19)

Educational Background, Gender and Age

There were 13 of the 32 immigrants involved in the study who had never used
a computer. Table 4.2 (data for the non adopters were extracted from Table
4.1) shows that nine of the non adopters were female, and 11 out of the 13
non adopters stated that their highest educational achievement was primary
school. Six non adopters had never received any form of education, four of
whom were women. Young, male participants with a relatively higher
educational background are more likely to be adopters. In contrast, older
female participants with no or little educational achievements are less likely to
participate in ICTs. This suggests that the variables of age, educational
background and gender are important factors that influence ICTs adoption by
immigrants. Five non adopter females did have home computer access but

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remained non adopters. This finding supports van Dijk and Hacker's (2003) and Warschauer's (2003) contention that provision of physical access is not enough to ensure adoption of ICTs. A likely explanation is that no schooling, together with lack of basic ICTs skills, contributes to non adoption.

Table 4.2

Non Adopters' Profile

Educational Background	Age	Computer Access at Home	Gender
None	65	No	M
None	62	No	M
None	62	Yes	F
None	56	Yes	F
None	24	No	F
None	19	Yes	F
Primary School	48	No	M
Primary School	32	No	M
Primary School	24	Yes	F
Primary School	22	Yes	F
Primary School	37	No	F
Secondary School	48	No	F
Secondary School	21	Yes	F

While the majority of the participants believed that ICTs are useful and potentially helpful, ICTs are generally accessed by younger immigrants who use the Internet to communicate with friends and family members overseas. They also access international news websites, Internet radios and participate in online community websites. However not all enjoyed these facilities with a 47 year old Somali woman responding to the question "Would you consider using computers in the future?"

> No. it is not my time. If it was my time I would do it. I am too old for it. (Haleema, Somali, F, 47)

Haleema's perception was that age precluded her from the technology. This woman had never received any formal schooling and it is possible that this also impacted on her confidence and the lack of ICTs uptake.

Language

The difficulty with the English language facing some of the participants surfaced as a barrier to their access to computers and the Internet particularly for those older immigrants with little or no educational achievements. Ali, whose highest educational achievement was primary school, illustrated such a difficulty

> I do not know anything about computers. I did not get any formal education about computers. Only my friend shows me how to use computers, emails for one to two weeks. He wrote the instruction of how to set up an email account, how to send and receive emails for me in Somali language. Every time I want to access my email I have to have this paper by my side. It would've been a lot easier if I could interact with the computers in Somali language. (Ali, Somali, M, 37)

The importance of having a 'friend' to help is once more identified by Ali as important to his learning as it was to Loui when he indicated that he calls for his friend's help.

Ibrahim, speaking about his auntie who is a Somali 38 year old stated that

> My auntie does not use computers, this due to her lack of English language. (Ibrahim, Somali, M, 24)

Computing Skills

As mentioned in Chapter 2, "skills" access and usage "access" have been identified by van Dijk (1999) as among the four types of technology access barriers. The participants' computer skills varied depending on their computer experience, educational background, age and usage. The results showed that the majority of interviewees who identified themselves as adopters have very basic Internet skills such as email and web surfing. However, the younger

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people who use computers in school-related work indicated that they knew how to use word processing programmes, spreadsheets and games. Only one of the participants, Pakistani IT professional, stated that he learned about "Visual Basic programming language, Oracle and SAP (Systems, Applications and Products in data processing)" back home.

ICTs Usage

This section presents interview data relating to the particular use that the immigrants were making of ICTs. The majority of participants started using computers for the first time, shortly after they had arrived in New Zealand. In response to the interview question "When did you start using computers?" only two household participants out of the 15 householders interviewed indicated that they had used computers prior to coming to New Zealand and even then, for the majority of them, access had been very limited.

> I used to use computers before I came here [New Zealand] but it was very limited very limited. (Farah, Somali, M, 26)

Teka attributes the lack of access to computers in his country of origin to the lack of usage opportunities

> Back home you only find computers in some government offices; it is not for everyone to use. (Teka, Ethiopian, M, 65)

ICTs are not exclusive to personal computers and these results revealed that there was at least one household member in all but three households who used cell phones, especially the younger members of the household. None of the interviewees said that they used any other communication devices such as Personal Digital Assistants (PDAs).

The participants' responses to the interview question "What do you use computers and the Internet for?" were categorised into three major themes. These themes are Communication with Friends and Family, Gathering Information and Following News from Back Home. Their responses are discussed in the following section.

Communication with Friends and Family

Interviewees were asked "What do you use computers for?" Communicating with friends and family members overseas was a common response in every interview. Sample responses are

> I use computers for emailing friends and family overseas and may be sometimes for following the news from New Zealand and back home. (Amjad, Somali, M, 27)

> Since I came to New Zealand I started to use the Internet more and more. I felt that I was so far away from my friends I needed someone to talk to. So I was like sitting chatting to people from back home; even people who I don't know. (Nahid, Middle Eastern, F, 20)

> We send our daughter pictures every now and then to our parents over the Internet. (Rajah, India, M, 33)

Even those who are not currently using computers indicated that they wanted to learn how to use computers and the Internet mainly to communicate with friends and family overseas

> Till now I did not get the chance to use computers because I do not have one here at home. I am currently studying English through M-class. I am at level three and they do not teach us computers at this level. I like to use computers because they help me to keep in touch with my relatives back home. (Daliya, Somali, F, 46)

Gathering Information

Some of the participants used computers to achieve tasks related to their school or jobs. This was particularly evident from the responses of many younger members of immigrant households who are still in school and/or

those with higher educational achievements. The following responses from Hao and Farah to the interview question "What benefit do you get from using computers and the Internet?" indicate the uses typical of many of the younger immigrants.

> I am thinking about studying journalism. This requires a lot of writing and researching. I have to use computers to do that. Now things are much easier through computers. This world would not be as fast as it is if it wasn't for computers. (Hao, Philippine, M, 19)

> Most of the time computers help me to find information; they help me write essays and school projects. It is easier to go into the computer instead of reading some books. It saves time and energy. (Farah, Somali, F, 17)

Following News from Back Home

All of the participants who use computers and the Internet stated that they mainly used them to follow news from their country of origin by accessing overseas-based newspapers or news sites in their native language. This was particularly important for older immigrants. Those who did not know how to use computers followed the news through overseas-based Internet radio in their native language with the help of their more technology-able relatives. An elderly Somali stated that

> Everyday I get my daughter to open the computer for me to listen to the BBC news in Somali. It is important to know what is going on there. (Abdi, Somali, M, 62)

Motivation

The participants' responses to the interview question "What made you decide to use computers and the Internet?" were categorised into four major themes. These themes are Relative Advantage, Friends and Family and Peer Pressure. The following section reports the interview results on each of these

themes which are described and illustrated with representative quotes and comments.

Relative Advantage

Participants indicated that they were motivated to use computers because they saw a relative advantage involving cost saving, and job prospects. Three participants said that using computers to communicate with friends and family is cheaper than using telephones and that they ended up saving money in the long run. Othman's comment illustrated this point.

> I need something to use to communicate with my family back home and using the phone was expensive. I found that the email and MSN Messenger was a cheaper alternative. (Othman, African, M, 24)

However this view was not shared by Nadia, when asked the question "Do you think using computers saves you money?" She referred to the initial cost of buying a computer and online Internet provider costs

> No. They end up costing you money. (Nadia, UAE, F, 22)

Friends and Family

Keeping in touch with family and friends surfaced as one of the main factors motivating participants to use and learn more about computers. The majority of the participants who identified themselves as computer users indicated that they first heard or saw a computer through a friend or family member and that they relied mainly on friends and family members to teach them how to use computers

> I just watched my friends, it was informal. It took me a long time; maybe six to eight months since I've watched my friends using computers to really start using computers. (Khmeis, Somali, M, 26)

Khadigaa was an independent self-learner. She said

> I learned about computers by myself. I was looking to what my husband and kids were doing then I copy them. I always keep an eye of what other people are doing with computers and then I try it later. (Khadigaa, Middle Eastern, F, 42)

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Peer Pressure

While family members were influential factors in some participants' adopting ICTs, others identified the immigrants' larger community as one of the major influences in their decision to use computers and the Internet. Many participants indicated that they were influenced by their fellow country people when answering the question "What made you decide to use computers and the Internet?"

> I think it is because everybody is using it [computer] so you know you just want to copy them. Everybody gone online, everybody has got free MSN account, everybody is chatting. You start asking yourself why not me? (Ifraxh, Somali, F, 17)

> The environment surrounding us encouraged us to use computers and the Internet. Because everybody is using them we decided to use them, it became a must to have computers even if you do not want to use them. It was like a fashion thing. (Nabilah, African, F, 24)

> It is a new technology. Everybody is using it, everyone in the community talks about it so you do not want to be sitting without knowing anything when they talk about it. (Akbal, Middle Eastern, F, 44)

Most of the immigrants lived in a close ethnic social network where there was a lot of mixing, meeting and getting together. New immigrants relied on trusted ties to co-ethnic "old immigrants" within this network for information about settling in the new country. This information included housing, rules and regulations of the new country, job opportunities and new technologies. The close involvement and reliance on the established immigrant community could be one of the reasons for the peer pressure indicated by the participants as important in their adoption of ICTs.

Internet Content in Immigrants' Language

Studies have shown that the majority of the world's websites are in English and are a significant barrier to ICTs adoption by people from non-English speaking background (Cullen, 2001; Hellawell, 2001; Lazarus and Mora, 2000; Van Dijk and Hacker, 2003). To overcome this barrier some local governments in the United States have incorporated foreign languages pages on their sites. West (2001) found that seven percent of city government websites have foreign language features that allow access to non-native English speaking individuals. The results of this study show that the majority of immigrants interviewed would like to see more New Zealand-based online contents, both government and ethnic community, in their native language. For example Nina, who came to New Zealand two years' ago with her husband and four years-old daughter, indicated the rarity of informative New Zealand sites in her language. She stated

> There are not much New Zealand based sites, I think, in our language. There are very few sites that we can access in Hindi our mother tongue. (Nina, Indian, F, 32)

Her husband referred to the importance of being able to access sites in Hindi, especially for their older family members, as Sanjeeve stated

> It is important, especially for our elders, to be able to access New Zealand content in our language. Most families come to New Zealand with elders who do not know much English. (Sanjeeve, Indian, M, 36)

Summary

Of the 32 interviewees, 19 (8 females and 11 males) were adopters and 8 of the households had a home computer. The non adopters were mostly females; older immigrants with little or no educational background, but some

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of them hoped to learn computing. It was noticeable that immigrants who are young (and male), with a relatively high education level, are more likely to participate in ICTs. Both adopters and non-adopters perceived ICTs as useful and important to them. The majority of non-adopters considered ICTs to be hard to use, while adopters, especially younger and relatively better educated immigrants, viewed ICTs as easy to use.

Despite many adopters being low-waged, and in some cases, unemployed most had computers and Internet access at home. The reasons given for placing such a high priority on home access were mainly related to the children's need to access computers to do school work, and convenience. This was especially important for female members of the family as it was considered inappropriate, in some cultures, for females to access computers at public places for long periods of time.

The participants' usage of ICTs revolved around communicating with friends and family overseas and following news from home. Friends and family and the immigrants' larger ethnic social network were the main influencing factors in their decision to adopt ICTs. Another factor was that communicating with friends and family using the Internet was more economically advantageous to them than conventional telephony services.

Friends and family members were cited as the main source of ICTs information for recent immigrants. The majority of the participants indicated that they first observed and learned about computers from a friend or family member. They also indicated that they preferred, especially older participants with little on no educational achievements, informal, one-on-one learning at home with the help of friends and family members.

One of the factors that deterred many older immigrants from participating in ICTs was their poor English language ability. All participants, even those with

good English language, emphasised the importance of accessing online content such as songs, Internet radios, cultural and religious literature and children's stories in their native languages.

The interview data were examined to identify any patterns of adoption rate related to the participants' region of origin. None was found in this study. The participants' adoption and non adoption patterns seemed to be affected by the immigrants' age, gender and educational background and are independent of their home countries or regions of origin.

This chapter presented the interview results organised under five major themes that surfaced during the analysis of the interview transcripts. The next chapter summarises the purpose of this study, approaches taken, findings, and conclusions. The limitations of this study are then discussed and finally, implications and recommendations for policy makers are presented along with suggestions for future research directions.

CHAPTER 5

SUMMARY

CONCLUSIONS AND IMPLICATIONS

The general purpose of this study was to understand the factors that influence the adoption or non adoption of ICTs by recently-arrived immigrants in the Wellington region. This chapter begins by presenting an overview of the specific objectives of the study, followed by the research design and findings. The limitations of the study are then discussed and the thesis concludes with a discussion of the implications and recommendations for practitioners who wish to promote ICTs adoption among disadvantage groups and future research directions.

Overview of the Study

The objectives of the study were to:

1. understand recently-arrived immigrants' perceptions of ICTs,

2. examine the factors that influence immigrants' adoption and non adoption of ICTs,

3. understand the process followed by recently-arrived immigrants when adopting ICTs, and

4. make recommendations, where appropriate, to assist in promoting ICTs usage among the immigrant community.

The study employed a qualitative research method using semi-structured interviews to collect data from recently-arrived immigrants living in 15

households. The immigrants were from developing countries who had settled in the greater Wellington area. Two rounds of interviews occurred in the months of October 2004 and May 2005.

Data from the audio-taped semi-structured interviews were transcribed and coded by the researcher and analysis was aided by QSR N6 qualitative data analysis software. The interview results were organised and presented in five themes and sub themes as described in Chapter 4.

Findings and Conclusions

The results show that among the 32 individual participants from the 15 households, 13 stated that they were non adopters and 19 identified themselves as adopters. The majority of the non adopters were older immigrants, especially women, five of whom had no educational background. The results also show that the majority of the participants who use ICTs use them in a very limited capacity. Hence there is a need to raise the awareness of this group of the enormous potential of ICTs and how they can positively impact their lives. The next section will present the findings and conclusions related to the specific objectives of this study.

Objective 1: Understand Recently-arrived Immigrants' Perceptions of ICTs

Overall, the interview results have clearly shown that the majority of recent immigrants perceived ICTs as useful and important for them thus providing the impetus for adoption. This finding confirms Rhee's and Kim's (2004) contention that a positive attitude towards technology is very important in influencing adoption. The majority of the non-adopters among the recent

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immigrant community indicated that technology was relevant to them and they would like to use ICTs. For example, two of the non adopters interviewed expressed their desire to learn how to use computers and the Internet if they were given the chance to do so. However, a non adopter participant did not express such a desire. She perceived ICTs as a tool for the younger generation and considered it was too late for her to participate in ICTs because of her age. Also, some of the recent immigrants perceived computers and the Internet to be difficult to use and struggled to learn the skills required to participate in ICTs.

Despite the difficulties in learning, however, none of the participants perceived ICTs negatively. Nevertheless, some parents expressed their concerns regarding what their children might access online. They thought that some of the Internet content contradicted their cultural, religious and social norms and they believed they needed to closely monitor their children's online activities.

Objective 2: Examine the Factors that Influence Immigrants' Adoption and non Adoption of ICTs

Overall, recent immigrants cited friends and family members as the main influencing factor in their decision to adopt ICTs. This was not surprising because new immigrants rely heavily on their immediate friends and family network for support, advice and information especially in the initial settlement period in a new country.

The second major influencing factor in recent immigrants' decisions to adopt ICTs was members of their larger-community. Recent immigrants indicated that they followed the lead of their trusted ethnic community peers in the use of ICTs and ownership of personal computers. The majority of ICTs adopters stated that they participated in ICTs because "everyone" in their community was doing so and they wanted to emulate this practice.

Recent immigrants perceived ICTs as an 'innovation' that gave them a relative advantage (such as cost savings when communicating with friends and family members overseas). As well, recent immigrants easily observed other, more established immigrants using ICTs in their homes. These two innovation characteristics of relative advantage and observability have been found to be influential in ICT adoption. Rogers (1995) shows that innovations that possess characteristics such as relative advantage and observability are likely to persuade potential adopters and hence increase the innovation's rates of adoption and this has been confirmed in this study.

The results revealed that physical access to ICTs and network connectivity did not appear a major adoption barrier for this group. All those who identified themselves as adopters indicated that they had access to computers and the Internet at home. A priority on home access was evident. Over half the interviewees stated that they owned their computer despite participants being low-waged and some unemployed. One of the reasons given for placing such a high priority on home access was that recent immigrants, especially females, did not feel comfortable accessing computers and the Internet outside the home. This could be attributed to the 'newness' of their new society together with cultural reasons where women are not allowed to access computers at public places for long periods of time. Another reason for the high computer ownership could to the steady decline in the prices of personal computers which makes ownership more affordable for this group.

Unlike the physical access factor, the 'skill access' and the 'usage access' factors identified by van Dijk (2003) appeared to be significant barriers to recent immigrants' adoption of ICTs. The majority of the participants indicated that they lacked computing experience (most of them stated that they started using ICTs after arriving in New Zealand). They had no formal ICTs training and it had not been part of their basic educational background. The majority said that they were totally dependent on their friends and family to gain the

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skills required for using technology. In many cases those friends and family members were new to ICTs and possessed elementary skills only.

The results showed that the majority of recent immigrants, especially females, older immigrants and those with none to limited educational background, lacked the opportunities to use ICTs in job (or school) related activities. The majority of the participants indicated that their ICTs usage was limited to communicating with friends and family members overseas and accessing news from back home. The lack of ICTs skills and usage opportunities identified by some recent immigrants are significant barriers to this group preventing them from realising the full potential of ICTs and participation in New Zealand's digital society.

Immigrants of all ages, regardless of education and ICTs experience, who participated in this study expressed their desire to see more online content, especially of New Zealand government sites that provide useful information necessary in their early re-settlement months. Examples of these sites relate to the departments and ministries of Inland Revenue, Work and Income, Education and Immigration. It is appreciated that immigrants are living in a country where English is the dominant language but information in the immigrants' native languages will aid the transition to their new society. Currently those who are not fluent in English rely on an intermediary for interpretation. Translations of parts of some United States government web sites are available in alternative languages, for example, for the Hispanic community and this has been found useful (West, 2001).

Objective 3: Understand the Process followed by Recently-arrived Immigrants when Adopting ICTs

The results revealed that the majority of the participants started using computers and the Internet after they had arrived in New Zealand. This was

not surprising because most of the participants came to New Zealand from developing countries where ICTs are not part of the basic education. In addition many of these countries lacked adequate and robust ICTs infrastructure and Internet connectivity (United Nations, 2003a).

Overall, the results indicated that the participants' decision process to adopt ICTs conforms to Rogers' (1995) five stages in the innovation decision process model described in Chapter 2. The participants stated that they first knew about ICTs from friends and family and that they observed their friends using ICTs for a period of time before they decided to adopt. This observation period varied from a few weeks to several months. The majority of the participants indicated that they were persuaded by friends and family and peers from their larger community to try and use ICTs.

None of the participants who identified themselves as ICTs adopters indicated that they discontinued or rejected ICTs after an initial adoption. However a few participants stated that the number of hours that they spent using computers and the Internet had reduced. This was attributed to, amongst other things, a decline in the level of their ICTs enthusiasm and interest, lack of usage opportunities and lack of time.

Despite some new immigrants attending free community computing classes to learn about ICTs, the preferred method cited by participants of this study was the one-on-one, face-to-face method. Sharing and exchanging information about ICTs was predominantly done through word of mouth and in a face-to-face setting (mostly in their own or a friend's home) with the co-ethnic community members being the primary source of information.

Objective 4: Make Recommendations, where Appropriate, to Assist in Promoting ICTs Usage among the Immigrant Community

The New Zealand government has recently presented its Digital Strategy (New Zealand Government, 2005) which aims for all New Zealanders, individuals and members of communities, to be able to use the power of ICTs to participate fully in the economic, social, cultural and democratic opportunities available in an information society. Similarly, Wellington City Council (WCC) supports a community initiative ICTs project called the Smart Newtown Project which aims "to create a community where all residents have the skills and access to become active participants in today's on-line world" (Smart Newtown p.1).

The following suggestions, based on the study findings, will be useful for policymakers and practitioners who wish to promote the use of ICTs among minority groups in general and the recently-arrived immigrant community in particular.

Raise recent immigrants' awareness of other potential ICTs usage. This study found that many immigrants were making limited use of ICTs. For instance, a number were predominately using the Internet for communicating with friends and family only and were unaware of the multiplicity of tasks and activities available through using computers. They had not accessed any New Zealand government sites, Internet banking, etc. Furthermore, applications such as word processing and spreadsheets were not generally used. There is evidence that once an individual's awareness is raised of the potential usefulness of ICTs, that person's ICT skill level consequently increases van Dijk and Hacker (2003). There is a need to raise the awareness of this group of the additional possibilities for using ICTs in their daily life such as learning English, Internet banking, paying bills, applying for jobs, dealing with local and central government online, children's education, etc.

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Provide informal ICTs education and training targeting women and older immigrants. There is much in the literature indicating that a socially inclusive approach is required for the promotion and adoption of technology Warschauer (2003). This approach stresses the importance of providing human resources to foster literacy and education as one of the major preconditions to the effective use of ICTs for social development. This study reveals that women and older immigrants are a potentially vulnerable group that face the risk of being digitally excluded from fully participating in society. A home-based ongoing and integrated training program should be developed to promote the use of ICTs and provide the required skills to use them. It is important that this takes an informal, relaxed approach, similar to that of the English for Speakers of Other Languages (ESOL) programme. Currently the ESOL programme delivers English language tuition which is specifically targeted to residents from non-English speaking backgrounds (Ministry of Education, 2002). The tuition is delivered by volunteers in one-to-one, social English groups, literacy programs, social events and home teacher services settings.

It is recommended that consideration be given to adding an ICT learning component (ICTLC) to the already-established ESOL programme. The ICTLC would focus on delivering basic computing skills within an existing, relaxed, friendly learning environment. These environmental attributes, together with no cost to the learners, would suit the learning style of, and motivate, the majority of new immigrants. The combining of ICT with English teaching has already been informally adopted in a community computing and ESOL environment (see Crump, 2004) with successful results. The blended teaching and learning has the advantage of introducing computing in a relevant and meaningful way and targeting immigrants more likely to be at greater risk of exclusion from digital technology because of their poor English abilities. By introducing ICTs within their own home there is a much higher likelihood of adoption for this particular group.

Requirements for implementing such a scheme would involve training the ESOL volunteers who are not familiar with computers. Those who were interested could be the first trainees and, if they were agreeable, then become trainers of additional volunteers. Computer equipment would, of course, be necessary. The results of this study showed that a surprisingly large number of immigrants owned their own computers but for those who did not, a scheme similar to the Computers in Homes (see http://www.computersinhomes.org.nz) whereby a computer is given for use by the family at nominal cost could perhaps meet this need. Of course the success of the ICTLC would depend, especially in the first instance, on the planning and involvement of ESOL and RMS personnel. Should representatives of these organisations see merit in the ICTLC it is recommended that a detailed plan and a pilot scheme be initiated to evaluate the feasibility of such a project.

Promote ICTs through community organisations and community leaders. This study shows that immigrants are greatly influenced by their community leaders and trusted co-ethnic members when considering ICTs adoption. The interpersonal communication channel is recommended as the most suitable and effective mode of communication among this group for the promotion and adoption of ICTs. This mode of communication could be facilitated by involving members of ethnic community organisations and the community leaders in any campaign designed to raise the awareness, and promote the use of ICTs among recent immigrants. Many of these people already act as 'champions' and leaders for their ethnic community in a variety of matters and therefore are in an appropriate position to reach the new members of their community.

Encourage and enable ethnic communities to build and maintain their own online communities. The lack of relevant content for specific ethnic groups has been identified by some researchers as a significant limitation to the adoption and usage of ICTs (Du, 1999; National Congress of American

Indians, 2001). Enabling ethnic communities with the resources required, for example ongoing training and support, to build and maintain their own websites, is vital. Immigrants' participation in such projects will increase their ICTs confidence, interest, and sense of ownership leading to more active involvement in ICTs. For such projects to be successful it must be need-led, for example provide information about job vacancies, and be compatible with the immigrants' social, cultural and religious beliefs. By empowering the ethnic communities to build and maintain their own websites these needs would be more closely met.

The recommendations presented here will go some way towards meeting the New Zealand government's and Wellington City Council goals of creating an inclusive society where all members, including recent immigrants, are able to access and have the skills required to use ICTs and hence be able to fully participate in the information society.

Limitations of the Study

The study revealed the recent immigrants' perceptions of ICTs as well as the factors that influence their adoption or non adoption but there were several limitations regarding the study's sample and its representativeness. First, data were collected from the residents of only 15 households who came from five regions; therefore the sample is not necessarily representative of the entire immigrant community. However, it does provide valuable insights to the factors that influence the adoption and non adoption of ICTs of recently-arrived immigrants from these five regions.

Second, participation in the study was limited to recent immigrants to New Zealand from developing countries. As a result the findings of this study are

specific to immigrants from those countries and may not necessarily be relevant for those from developed nations. Immigrants from developed countries are likely to have had very different life experiences as well as opportunities for access to ICTs compared with immigrants from developing nations.

A third possible limitation is that of interviewer bias identified by Robson (2002) who suggested that unless strategies are in place to counter this, the dependability of the interpretation is in question. To offset interviewer bias different strategies were used. First, two rounds of audio-taped interviews were conducted and the interview transcripts were returned to the participants for validation during the second interview. Second, triangulation on different sources, which involved data, time and space, were used during the data collection for this study. If resources had allowed, the participation of a second interviewer would be another way to counter possible interviewer bias.

Finally, the results are limited to immigrant groups living in the greater Wellington region. ICTs perceptions and adoption processes may well be similar to immigrant groups living in other areas in New Zealand. However, it is difficult to generalise these findings with confidence to the entire New Zealand immigrant community, especially for those who live outside the main cities. A follow-up study that widened the sample to include immigrants from other cities in New Zealand would give a national understanding of ICTs adoption by new immigrants.

Implications and Suggestions for Further Research

This research examined recent immigrants' perceptions of ICTs as well as the factors that influence their adoption or non adoption of ICTs using a qualitative

research method. Lack of empirical studies in this area motivated the researcher to undertake the current study. The qualitative approach provided valuable insights into the immigrants' perceptions of ICTs. However, a deeper and more detailed understanding could be gained if future studies adopted a mixed research method, combining both qualitative and quantitative approaches. The quantitative part of any such study would need to be carefully designed and strategies employed to ensure understanding of the survey by the recent immigrant sample. This may include use of multi-lingual questionnaires and/or oral questionnaires. The use of a mixed method helps to overcome some of the weaknesses, biases and limitations of a single approach (Patton, 1990).

Lessons learned from this research indicate the efficacy of using two rounds of interviews when conducting qualitative studies with groups who may be vulnerable or hesitant to participate. The two interviews, held in the immigrants own homes proved to be a successful strategy because it was noticeable that participants were more relaxed and spontaneous during the second round of interviews. Such approach could be adopted in similar studies with vulnerable groups.

Finally, it is recommended that further research is conducted to replicate this study using a larger sample size and participants from different locations. This would overcome some of the limitations of this study identified earlier.

Reference List

Ajzen, I. (1985). From intentions to action: a theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), *Action control: From cognition to behaviour* (pp. 11–39). Berlin, Germany: Heidelberg Springer.

Batty, M., Dobrovolny, J., Sherry, L., Ryder, M., & Wilson, B. (2002). Adoption factors and processes. In H. H. Adelsberger, B. Collis, & J. M. Pawlowski (Eds.), *Handbook on information technologies for education and training*. NY: Springer.

Benbasat, I., Goldstein, D., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*(3), 369-386.

Brancheau, J. C., & Wetherbe, J. C. (1990). The adoption of spreadsheet software: testing innovation diffusion theory in the context of end-user computing. *Information Systems Research, 1*(2), 115-143.

Brown, C., & Gay, P. (1985). *Racial discrimination: 17 years after the act.* London: Policy Studies Institute.

Brown, S., & Venkatesh, V. (2005). Model of adoption of technology in households: A baseline model test and extension incorporating household live cycle. *MIS Quarterly, 29*(3), *399-426.*

Burrows, R., Loader, B., Pleace, N., Nettleton, S., & Muncer, S. (2000). Virtual community care? Social policy and the emergence of computer mediated social support. *Information, Communication and Society, 3*(1), 95-121.

Campbell N. (2002). *Socio-cultural impacts of information and communication technologies on immigrants in New Zealand.* Hamilton: New Zealand: Dept. of Management Communication, University of Waikato.

Carvin, A., Hill, J., & Smothers, S. (2004). *E-Government for all: Ensuring equitable access to online government services.* Newton, MA: EDC Center for Media & Community & The NYS Forum.

Castells, M. (1999). The information city is a dual city: Can it be reversed? In D. Schön, B. Sanyal, & W. Mitchell (Eds.), *High technology and low-income communities: Prospects for the positive use of advanced information technology* (pp. 25-43). Cambridge, Mass and London: MIT Press.

Chonia, G. (2002). *Bridging the digital divide in a digital society.* Switzerland: University of Zurich, Centre for Computing.

Cooper, C. (2001). Not just a numbers thing: Tactics for improving reliability and validity in qualitative research. *Research Methods Division, 6,* 1-23.

Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches.* Thousand Oaks, CA: Sage.

Crump, B. J. (2002). *First-year programming students' perceptions of their tertiary learning environment*, Doctoral thesis, Curtin University of Technology, Perth, Australia.

Crump, B. J. (2004). Immigrants, Language and ICT: Factors for Success in Blended Learning. In *Proceedings of Informatics and RWICT 2004 International Conference*, Kuala Lumpur, Malaysia, 28-30 July, Vol 2, pp. 1175-1184.

Cullen, R. (2001). Addressing the digital divide. *Online Information Review, 25*(5), 311-320.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: Comparison of two theoretical models. *Management Science, 35*(8), 982-1003.

Denzin, N. K., & Lincoln, Y. S. (1998). *The landscape of qualitative research theories and issues.* Thousand Oaks, CA: Sage.

Department of Labour. (2001). *Globalisation of labour flows and its impacts on New Zealand.* Wellington, New Zealand: Department of Labour.

Du, X. (1999*).* Internet adoption and usage in China. *Proceedings of the 27th TPRC,* Alexandra, VA, September 25-27, 1999.

Ethnic Affairs Service. (1996). *High hopes: A survey of qualifications, training and employment issues for recent immigrants in New Zealand,* Wellington: Department of Internal Affairs.

EuroPACE. (2003). *Social inclusion/exclusion.* Retrieved November 6, 2004, from http://www.europace.org/s2net/docs/wp6/Social%20Inclusion%20Stateme nt.doc.

European Commission. (2005). *Social inclusion strategy.* Retrieved January 3, 2005, from http://europa.eu.int/comm/employment_social/social_inclusion/docs/coun ciltext_en.pdf.

Fichman, R. G. (1992). Information technology diffusion: A review of empirical research. *Proceedings of the Thirteenth International Conference on Information Systems (ICIS), 195-206.*

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research.* Boston: Addison Wesley.

Galliers, R. D. (1992). Choosing IS research approach. In R. D. Galliers (Ed.), *Information systems research: Issues, methods, and practical guidelines* (pp. 144-162). Oxford, England: Blackwell Scientific.

Gallivan, M. J. (2001). Organizational adoption and assimilation of complex technological innovations: Development and application of a new framework. *The Data Base for Advances in Information Systems, 32*(3), 51-85.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory*. London: Weidenfield & Nicolson.

Greene, J., Caracelli, V., & Graham, W. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11(3)*, 255-274.

Gubbay, D., & Cogill, S. (1988). *An asset to the country: The effective use of educational resources to assist the successful settlement of immigrants and refugees*, Wellington, New Zealand: Ministry of Education.

Hellawell, S. (2001). *Beyond access: ICT and social inclusion*. London: Fabian Society.

Hellwig, O., & Lloyd, R. (2000). *Sociodemographic barriers to utilisation and participation in telecommunications services and their regional distribution: A quantitative analysis*. Retrieved December 12, 2004 from http://www.natsem.canberra.edu.au/pubs/netaccess-barriers.html.

Ho, E., Cheung, E., Bedford, C., & Leung, P. (2000). *Settlement assistance needs of recent migrants*. Wellington, New Zealand: Department of Labour.

Jarzabkowski, L. (2001). Emotional labour in educational research. *Queensland Journal of Educational Research, 17*(2), 123-137.

Jenkins, A. M. (1985). Research methodologies and MIS research. In E. Mumford (Ed.), *Research methods in information systems*. North-Holland: Elsevier Science Publisher.

Jones, T. (1993). *Ethnic minorities: An analysis of the labour force survey*. London: Policy Studies Institute.

Kahn, R., & Cannell, C. (1957). *The dynamics of interviewing: Theory, technique, and cases*. NY: Wiley.

Keegan, Legard, & Ward. (2003). In-depth interviews. In J. Lewis, & J. Ritchie (Eds.), *Qualitative research practice: A guide for social science students and researchers*. London: Sage.

Kvale, S. (1996). Interviews*: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage Publications.

Kwon, T. H., & Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In R. J. Boland, & R. A. Hirschheim (Eds.), *Critical issues in information systems research*, (pp. 227-251). NY: John Wiley & Sons.

Lazarus, W., & Mora, F. (2000). *Online content for low-income and underserved Americans. The digital divide new frontier.* Santa Monica, CA: The Children's Partnership.

McLaren, J., & Zapala, G. (2002). The 'digital divide' among financially disadvantaged families in Australia. *First Monday, 7*(11). Retrieved February 18, 2004, from http://www.firstmonday.org/issues/issue7_11/mclaren/

Maharey, S., & Swain, P. (2000). *Closing the digital divide - What do we know about the digital divide in New Zealand?* A cabinet paper. Wellington: New Zealand Government.

Malmgren, P. (1999). *Surviving not living: A study of a library and its users in Northern Tanzania.* Retrieved November 17, 2004, from http://www.hb.se/bhs/slutversioner/2000/00-33.pdf

Marshall, C., & Rossman, G. (1995). *Designing qualitative research.* CA: Sage.

Miles, M. B., & Huberman, A. M. (1984). *Qualitative data analysis: A new sourcebook of methods.* Beverly Hills, CA: Sage.

Ministry of Education (2002). *The adult ESOL strategy.* Wellington, New Zealand: Ministry of Education.

Miniwatts International. (2005). *Usage and population statistics.* Retrieved June 2, 2005, from http://www.internetworldstats.com.

Mitchell, M. (2002). Exploring the future of the digital divide through ethnographic futures research. *First Monday, 7*(11). Retrieved February 15, 2004, from http://www.firstmonday.org/issues/issue7_11/mitchell/

Moriarty, E., & Ugba, A. (2003). *New connections, Old exclusions: Ethnic Minorities in Ireland's new Information Society.* Paper presented at the EMTEL Conference, 23-26 April 2003, London School of Economics, London. Retrieved February 11, 2005, from http://www.emtelconference.org

Morris, C. (2001). Interview with Marvin Andrade, the Central American Resource Center (CARECEN). *The Digital Divide, 1*(2). Retrieved December 18, 2004, from http://tcla.gseis.ucla.edu/divide/community/lausd_andrade.html

Mun Wong, L. (1998). The ethics of rapport: Institutional safeguards, resistance, and betrayal. *Qualitative inquiry, 4*(2), 178-199.

National Congress of American Indians. (2001) *Connecting Indian Country: Tribally-Driven Telecommunications Policy.* Retrieved December 16, 2004, from http://130.94.214.68/main/pages/newsreleases/NCAI%20Telecom%20Pol icy%20Report%20Final.pdf

New Zealand Government. (2004). *Digital strategy: A draft New Zealand digital strategy for consultation.* Wellington: New Zealand Government.

New Zealand Government. (2005). *The digital strategy: A summary*. Retrieved July 29, 2005, from http://www.digitalstrategy.govt.nz/upload/Documents/MED11706_Summary.pdf

New Zealand Immigration Service. (2000). *Settlement kit.* Wellington, New Zealand: Department of Immigration Service.

New Zealand Immigration Service. (2003). *Migrants in New Zealand: An analysis of 2001 census data.* Wellington, New Zealand: Department of Labour.

New Zealand Immigration Service. (2004*). Migrants' experiences of New Zealand.* Wellington, New Zealand: Department of Labour.

Norman, N. R., & Miekle, K. (1985). *The economic effects of immigration on Australia.* Melbourne: Committee for Economic Development of Australia.

NTIA. (2000). *Falling through the net: Toward digital inclusion.* Retrieved October 7, 2003, from http://www.tprc.org/ABSTRACTS99/DUPAP.PDF.

NTIA. (2002). *A nation online: How Americans are expanding their use of the Internet* Retrieved September 12, 2004 from http://www.ntia.doc.gov/ntiahome/dn/nation_online.pdf.

Patton, M. Q. (1980). *Qualitative research methods*. Beverly Hills, CA: Sage.

Phillips, D. C. (1987). *Philosophy, science, and social inquiry: Contemporary methodological controversies in social science and related applied fields of research.* NY: Pergamon Press.

Prescott, M. B., & Conger, S. (1995). Information technology innovations: A classification by IT locus of impact and research approach. *Data Base, 26*(2-3), 20-41.

Qualitative Solutions and Research Pty Ltd (2002). QSR N6. [Computer software] Melbourne, Australia: QSR International Pty Limited.

Rhee, K., & Kim, W. (2004). The adoption and use of the Internet in South Korea. *Journal of Computer-Mediated Communication (JCMC), 9*(4). Retrieved December 10, 2004, from http://jcmc.indiana.edu/vol9/issue4/rhee.html

Robson, C. (2002). *Real world research*. Oxford, England: Blackwell.

Rogers, E. M. (1995). *Diffusion of innovations* (4th Ed.). NY: The Free Press.

Rogers, E. M. (2003). *Diffusion of innovations* (4th Ed.). NY: The Free Press.

Russell, C. (1999). Interviewing vulnerable old people: Ethical and methodological implications of imagining our subjects. *Journal of Aging Studies, 13*(4), 403-17.

Smart Newtown. *Smart Newtown project website*, Retrieved March 01, 2005 from http://www.smartnewtown.org.nz/

Smith, D. J. (1974). *Racial disadvantage in employment*. London: Political and Economic Planning.

Statistics New Zealand. (2002a). 2001 *Census of population and dwellings: Ethnic groups*. Wellington: Statistics New Zealand.

Statistics New Zealand. (2002b). *2001 Census of population and dwellings: People born overseas*. Wellington: Statistics New Zealand.

Strauss, A. L. (1987). *Qualitative Analysis for Social Scientists*. Cambridge, England: Cambridge University Press.

Sword, W. (1999). Accounting for presence of self: Reflections on doing qualitative research. *Qualitative Health Research, 9*(2), 270-278.

Tetiwat, O., & Huff, S. (2002). Determinants of the adoption of web-based educational technology: A preliminary analysis of New Zealand tertiary educators. *Ieee international conference on computers in education,* December 3-6, (pp. 447 451) Vol.1, NY: IEEE.

Todd, P., & Benbasat, I. (1987). Process tracing methods in decision support systems research: Exploring the black box. *MIS Quarterly, 11*(4), 492-512.

Trlin, A., North, N., Pernice, R., & Henderson, A. (1998). The new settlers programme: Encounters, responses, policies: An introduction to a research project. In R. Panny (Ed.), *People - people - people: Proceedings, comments essays* (pp. 274-290), Christchurch, New Zealand: Federation of Ethnic Councils.

United Nations. (2003a). *Annual report of the information and communication technologies taskforce*. NY: Economic and Social Council, United Nations.

United Nations. (2003b). *World public sector report 2003: E-government at the crossroads*. NY: United Nations.

van Dijk, J. (1999). *The network society: Social aspects of new media*. London: Sage.

van Dijk, J, & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society, 19*(4), 315-326.

Waite, J. (1992). *Aoteareo: Speaking for ourselves: A discussion on the development of a New Zealand language policy, Part B: The issues*. A report commissioned by the Ministry of Education. Wellington: Learning Media.

Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: The MIT Press.

West, D. M. (2001). *Urban e-government: An assessment of city government.* Retrieved on April 18, 2005, from http://www.brown.edu/Departments/Taubman_Center/polreports/egovt01 city.html

Winkelmann, L., & Winkelmann, R. (1998). *Immigrants in New Zealand: A study of their labour market outcomes.* Wellington: Department of Labour.

Appendix 01

MUHEC Approval

Eltahir Kabbar
Department of Information Systems
WELLINGTON

Dear Eltahir

Re: Factors that influence adoption (and non-adoption) of ICTs by Wellington immigrant community

Thank you for the MUHEC Checklist and Section A of the MUHEC Application Form that was received on 10 November 2003.

As specified in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants, persons who submit the MUHEC Checklist with every question answered with a 'no', together with Section A of the MUHEC Application Form (including a signed Declaration), may proceed with their research without approval from a Campus Human Ethics Committee. You are reminded that this delegated authority for approval is based on trust that the Checklist has been accurately filled out. Please notify me if situations subsequently occur which cause you to reconsider your initial ethical analysis.

Please ensure that the following statement is used on all public documents, and in particular on Information Sheets:

"This project has been reviewed, judged to be low risk, and approved (*note to applicant: include the process below that is most appropriate to practice within your Department, School or Institute*)
    by the researcher
    by the researcher and supervisor
    by peer review *(if you followed that process)*
    by other appropriate process *(outline the process appropriately)*
under delegated authority from the Massey University Human Ethics Committee. If you have any concerns about the conduct of this research, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Equity & Ethics), telephone 06 350 5249, email humanethics@massey.ac.nz".

Please note that if a sponsoring organisation, funding authority, or a journal in which you wish to publish requires evidence of Committee approval (with an approval number), you will have to provide a full application to a Campus Human Ethics Committee.

Yours sincerely

Sylvia Rumball.

Professor Sylvia V Rumball, Chair
Assistant to the Vice-Chancellor (Equity & Ethics)

cc   Ms Barbara Crump
      Department of Information Systems
      WELLINGTON

Appendix 02

Information Sheet

Factors That Influence the Adoption and Non Adoption of Information and Communication Technologies (ICTs) By Recently-arrived Immigrants in the Wellington Area

Researchers:

Dr Barbara Crump (Supervisor)
  Contact: b.j.crump@massey.ac.nz
  Phone: 04 801 2794 ext 6881

Eltahir Kabbar
  Contact: e.f.kabbar@massey.ac.nz
  Phone: 04 801 2794 ext 6122

I am a Masters student at Massey University, Wellington New Zealand. I am undertaking this research project as part of my study program. This project aims to increase our understanding of the factors that influence the adoption and non adoption of Information and Communication Technologies (ICTs) focusing on new immigrants in the Wellington area.

The main objectives are to:

1. understand recently-arrived immigrants' perceptions of ICTs,
2. examine the factors that influence immigrants' adoption and non adoption of ICTs,
3. understand the process followed by recently-arrived immigrants when adopting ICTs, and
4. make recommendations, where appropriate, to assist in promoting ICTs usage among the immigrant community.

To gather this information, contact has been via the Refugee and Migrant Services (RMS), asking recent immigrants in the Wellington area to participate in the study. The immigrants have been selected for in-depth semi-structured interviews according to the number of years that they have been in New Zealand and their country of origin. Two rounds of interviews, of approximately 45 minutes each will be audio-taped, and transcribed by the researchers prior to analysis. The interviewee has the right to request that the audio tape be turned off at any time during the interviews. Tapes and transcriptions will be kept in a secure cabinet in my office, and will be

disposed of after five years. Participants' real names and details will be confidential and will not appear in any of the publications without their permission.

The transcript data will be analysed and the results will be reported and published both nationally and internationally. A summary of the research findings will be made available to you by contacting the researcher. Likewise, if you would like further information at any time please contact the researcher.

At any time you have the right to:

- Decline to participate
- Decline to answer any particular question
- Withdraw from the study
- Ask any questions about the study at any time during participation
- Provide information on the understanding that your name will not be used unless you give permission to the researcher
- Be given access to a summary of the project findings

If you agree to participate, please sign the Consent Form attached.

Thank you for your help.

Appendix 03

Consent Form

Factors That Influence the Adoption and Non Adoption of Information and Communication Technologies (ICTs) by Recently-arrived Immigrants in the Wellington Area

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF FIVE (5) YEARS

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to the interview being audio taped.

I agree to participate in this study under the conditions set out in the Information Sheet

Signature: .... Date: ....

Full Name – printed ....

Appendix 04

Interview Questions

Date: Place:
Time begins:_____   End:_____

Interview Reminders

Briefly explain the aim of the study, type of questions
Assure the participants that all information collected will be confidential and private.
Hand in the information sheet
Get participant to sign the consent form.

Section 1 (ICTs background)

1-1   Do you use computers? (*A/N*) (*if yes, where do you access computers*)

1-2   Do you use the Internet? (*A/N*) (*if yes, where do you access the Internet*)

1-3   Do you use any other type of communication devices? (*Cell phones, PDA etc*) (*A/N*)

1-4   In the long-term what do you think computers will enable you to do? (*e.g. getting a job, getting a better job, knowing about NZ culture/life etc*)

1-5   When did you start using computers? (*How many years/months, if answered N to q 1-1, 1-2, 1-3 go to section 4*)

1-6   When did you start using the Internet? (*Country of origin/NZ, home, work, community centre etc*)

1-7   What do you use computer for? (*word processing, games, Internet etc*)

1-8   What do you use the Internet for? (*Communication, email, e-commerce, to find jobs etc*)

1-9   What benefits do you get from using computers? (*Cost saving, convenient, keep in touch with friends and family etc*)

1-10   What benefits do you get from using the Internet?

1-11   How many hours do you use computers per week (approx)?

Section 2 (Factors influencing the adoption)

2-1   What made you decide to use computers? *(Relative advantage, compatibility, complexity, Trialability & Observability, cost, access etc).*

2-2   What made you decide to use the Internet? *(Relative advantage, compatibility, complexity, Trialability & Observability, cost, access etc).*

Section 3 (The adoption process)

3-1   Can you tell me how did you get into computing? *(Timeframe, stages of adoption etc)*

3-2   Can you tell me how did you get into using the Internet?

Section 4 (Non adopters)

4-1   Would you like to have used computers? *(Y/N) (if N go to 4-2 else go to 4-3)*

4-2   Can you tell me why they don't interest you? *(too hard, no time not interested, language difficulties, skills etc)*

4-3   Why haven't you tried to use computers or the Internet? *(Relative advantage, compatibility, complexity, Trialability & Observability, cost, access etc)*

4-4   Why haven't you tried to use other communication devices? *(e.g. mobile phones, PDA etc)*

4-5   Do you consider using computers in the future? Why and why not?

4-6   Do you consider using the Internet in the future? Why and why not?

Section 5 (Personal Information)

Name:

Gender: M   F

Age

       0-15   *16-20*   *21-25*   *26-30*   *31-35*

       36-40   *41-45*   *45-50*   *more than 50*

Education:

      None   *Primary School*   *Secondary School*   *Tertiary*

Ethnicity:

Do you have any questions for me?
Thank you for your time.

Appendix 05

Interview Categories and Themes

1. Immigrants' perceptions of ICTs

    a. Perceived Usefulness
    b. Perceived Ease of Use
    c. Perceived Importance

2. ICTs Access

    a. Computer Access at Home
    b. Educational Background, Gender and Age
    c. Language
    d. Computing Skills

3. ICTs Usage

    a. Communication with Friends and Family
    b. Gathering information
    c. Following News from Back Home

4. Motivation

    a. Relative advantage
    b. Friends and family
    c. Peer pressure

5. Internet Content in Immigrants' Language