

**User-centric digital inclusion:
Linking Australia's digital divide policy and digital exclusion experiences**

Jee Young Lee

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Abstract

In recognising the importance of information and communications technology (ICT) in national development, many countries have developed policy frameworks intended to facilitate ongoing investment in ICT infrastructure and stimulate user adoption. While connectivity is increasing, a significant division between those who use technology effectively and those who do not has emerged as a new digital gap. As society becomes highly digitalised, the economic, social, political and cultural disadvantages arising from the inability to use technologies effectively have become more significant. This study investigates how the Australian Government has addressed the digital divide issue and the nature of emerging digital inclusion gaps as informed by the digitally excluded groups. The purpose was to contribute to a nuanced understanding of digital exclusion and to inform policy making with empirical knowledge. Two research methods were adopted: policy analysis and in-depth interviews with digitally excluded groups.

The policy analysis investigates how the Australian Government has perceived and defined the “digital divide” over time since 1997, and its relevance to policy making. This examination includes official, publicly available ICT policies and strategies and the types of efforts – supply- and demand-side – aimed at diffusing the use of ICTs in society. Australia is considered a highly-connected society; however, its ICT diffusion has stalled over the last decade. This suggests that supply-side policies that focus on access to infrastructure may not be sufficient to stimulate use, nor effective at addressing the persistent digital divide. The demand-side of ICT diffusion policies, which aims at effective use, has so far received less attention than supply-side dimensions. Although the government has begun recognising the growing importance of demand-driven projects for digital inclusion, the complex conditions that inhibit effective use of technologies are not yet systematically incorporated in policies or programs. A need for empirical evidence of the deep-rooted circumstances of the digitally excluded emerged from the policy analysis.

Twenty-one in-depth interviews were conducted with non- and limited users of the internet in Canberra, Australia in order to understand their daily-lived experiences with technology and resulting digital exclusion. By analysing participants’ everyday experiences with ICTs, the lack of social encouragement and support/assistance was identified as latent but crucial circumstances surrounding non- and limited uses. It was evident that non-engagement

impacted participants' everyday lives in many ways, regardless of their level of technological use or non-use. Individual stories of exclusion in everyday life revealed the multifaceted reality of the digitally excluded and the relative nature of digital exclusion. This study emphasises the importance of social resources, including ongoing support and encouragement, to digital inclusion outcomes. It suggests there are different dimensions that must be considered when addressing digital skills and social constraints, both of which contribute to non-engagement. The thesis suggests that the success of future digital inclusion policy relies on implementing effective means to facilitate new forms of ongoing social support surrounding the use of digital technologies that are deeply embedded in our everyday lives.

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List of Abbreviations

ABS	Australian Bureau of Statistics
ACMA	Australian Communication and Media Authority
ACT	Australian Capital Territory
ADII	Australian Digital Inclusion Index
AGIMO	Australian Government Information Management Office
BRACS	Broadcasting from Remote Aboriginal Communities Scheme
CDMA	Code Division Multiple Access
DBCDE	Department of Broadband, Communications and the Digital Economy
DCA	Department of Communications and the Arts
DCITA	Department of Communications, Information Technology and the Arts
DSL	Digital Subscriber Line
DTO	Digital Transformation Office (former Digital Transformation Agency, DTA)
FTTN	Fibre To The Node
FTTP	Fibre To The Premises
GSM	Global System for Mobile Communications
ICT	Information and Communications Technology
ISP	Internet Service Provider
ITU	International Telecommunication Union
NBN	National Broadband Network
NBN Co	National Broadband Network Company
NBS	National Broadband Strategy
NOIE	National Office for the Information Economy
NTN	Networking the Nation
OECD	Organisation for Economic Co-operation and Development
TAPRIC	Telecommunications Action Plan for Remote Indigenous Communities

Chapter 1 Introduction

1.1. Research context

Intensive investment in information and communication technologies (ICT) development is based on a widely-held belief that such technologies have the potential to improve social environments by reducing economic and social constraints, including geographic distance, cost and time. Ultimately, ICT development is expected to spur the overall betterment of society. As a result of this heavy investment in ICT infrastructure, particularly in developed nations, there has been substantial growth in the digital economy. According to a report produced by Deloitte in 2015, digital technologies, including the internet, contributed \$78.8 billion to Australia's economy and accounted for 5.1% of GDP (Gross Domestic Product), including \$51.7 billion to non-ICT private sectors and \$14.1 billion to education, health and government¹. Digital technologies have become an integral part of entertainment, communication and information social systems, and government agencies and companies are increasingly offering products, services and information through digital platforms in an effort to improve efficiency and convenience for users.

However, while ICTs are critical to Australia's economy, as they are elsewhere, the economic outcomes and benefits of national-level innovations have not automatically resulted in benefits to individuals. ICT development has the potential to empower users, but it has also brought about increased marginalisation and disempowerment (Selwyn & Facer, 2010), particularly for those who do not have access to digital technologies. It has been argued that, while some are advantaged by the efficiencies and conveniences of these innovations, those who do not have access to the technologies may become further marginalised.

One of the most common frameworks used for looking at these issues is the digital divide, a notion which suggests that there is a societal gap between the "haves" and "have nots" or in other words, between those who have access to ICTs and those who do not. To date, numerous studies on the digital divide have examined existing socially excluded groups that are less likely to gain access to digital technologies (Kvasny, 2005; Roe & Broos, 2005; Van Dijk & Hacker, 2003). These groups have been characterised as digitally excluded mostly as a result of gender, age, income, race, education, region or disability (Verdegem & Verhoest,

¹ Deloitte Access Economics were sourced by ABS 5260.0 National Accounts, ABS 8219.0, Business use of Information Technology 2011-12.

2009). The focus of digital divide policies has been mostly on the reduction of the access gap between the general population and these socially excluded groups. While social and digital exclusion largely overlap, there is an emerging digital underclass that has not been adequately conceptualised or addressed in academic discourse (Eynon & Geniets, 2011; Livingstone & Helsper, 2007; Park, Middleton, & Allen, 2013). Those who are unable to benefit from ICTs are digitally excluded regardless of their social exclusion status, which implies that a new type of social exclusion, derived as a consequence of being digitally excluded, can potentially emerge in all sectors of society (Selwyn & Facer, 2010). In this vein, digital exclusion is understood as translating to disadvantage in various social contexts such as employment and education. Given that digital exclusion can emerge in various domains of society and lead to individuals being excluded from social, economic, political and cultural opportunities.

The Broadband Commission for Digital Development² (International Telecommunication Union (ITU), 2012) suggested that all countries should strive to ensure that their people can participate in emerging knowledge societies. The Commission proposed four goals: making broadband policy universal; making broadband affordable; connecting homes to broadband; and getting people online. The Commission's goals imply that ICT policies should be focused on how to involve people in the vision of a digitalised society and how essential needs - social, cultural, economic and political - can be addressed by using technologies. This approach is best described by Galperin (2010) who writes that "a key question is not how to connect people to a specific network through a specific device, but how to extend the expected gains from new ICTs" (p. 55).

In light of this shift of focus from the diffusion of technology to enabling users, digital divide policies must recognise the importance of balancing the universal provision of technologies and desired outcomes in order to realise digital inclusion. Many studies have attempted to provide new insights into policies. However, the discussions have not been followed by sufficient empirical and evidence-based research. In terms of the digitally excluded, "new and creative theoretical frames of mind are needed, especially in societies that already have higher levels of computer and internet penetration" (Verdegem & Verhoest, 2009, p. 644).

² The Broadband Commission for Digital Development comprises global and government leaders from around the world and highest level representatives from relevant industries, international agencies, civil society and organisations concerned with development, brought together to debate policy guidance and best practices with regard to the deployment and roll-out of broadband networks and services (Measuring the Information Society (MIS), 2012, p.9).

Digital exclusion is defined as the inability to effectively use and take advantage of ICTs, rather than not having access to ICT infrastructure. Access is a necessary but insufficient condition on its own for the effective use of technologies. How people use – or do not use – technology can result in a wider gap in effective use. Milner (2006) argues that the policy goal for digital inclusion should be to achieve meaningful internet access for all which is relevant, affordable and available, and which enables users to transform access into information and resources. Despite the fact that many societies have already reached high levels of ICT penetration, the benefits of ICT can be unavailable, inaccessible or unaffordable to many members of society. The disadvantage experienced by those who cannot effectively use technology increases as offline-based services are reduced or, in some cases, even made unavailable.

1.2. Aims and objectives

Within the context of the concerns about digital exclusion outlined above and the dearth of empirical research into digital inclusion policy, this study sets out to understand digital exclusion via the voices of those who are digitally excluded. More specifically, this study focuses on what is occurring in non- and limited users' daily lives, rather than simply assuming a direct link between non-use and digital exclusion; this approach has been advocated in the literature on the digital divide. Despite the importance of such an approach, there is a lack of empirical evidence relating to the effects of exclusion on individuals. In other words, questions of what practices individuals are excluded from and how exclusion affects their lives, remain unaddressed. With this research gap in mind, this study explores digital exclusion, drawing from the experiences of non-, infrequent and ineffective users of digital technologies in their everyday lives.

The overarching aims of this research are to investigate how digital divide policies are addressing the issue and the nature of the new gaps that are emerging in a hyperconnected world. By including a broad range of non-users, there is particular focus on what digital exclusion *means* for individuals, rather than on who the digitally excluded are. Ultimately it is expected the study will contribute to a more refined understanding of digital exclusion and provide better insight into digital inclusion policy making.

The specific objectives of this research are:

- To explore the nature of policies and strategies related to the reduction of the digital divide in Australia;
- To identify gaps and weaknesses in relevant policies from the users' point-of-view;
- To gain a deeper understanding of daily-lived experiences with technology and the resulting digital exclusion.

1.3. Research questions

While connectivity is increasing, the gap between those who use technology effectively and those who do not remains unaddressed. The fundamental solution can be found by implementing evidence-based policies that target the deep-rooted factors behind digital exclusion. There is a need for a thorough examination of policies and empirical evidence from the digitally excluded groups, in order to effectively resolve this persistent digital exclusion issue. From the three research objectives laid out above, six research questions were set up.

In the first phase of the study, the diverse dimensions of both the supply-side and demand-side policy established by the Australian government is examined in the hope of understanding how the government defines the digital divide in policy making. In particular, the following research questions are explored:

- How has Australia perceived and defined the “digital divide” over time?
- What has been the main focus of digital divide policies in Australia?
- What are the gaps and weaknesses of the policies?

The second phase of the study focuses on non-users and is based on the knowledge gap that is evident within digital divide and digital exclusion research. I investigate what is occurring in non- and limited users' daily lives, rather than simply assuming a link between non-use and digital exclusion. In order to ascertain the underlying circumstances of non- and limited use and resulting digital exclusion, the research questions are as follows:

- What are the reasons for non- and limited use? What are the barriers to adoption and usage?
- What are the disadvantages of not using the internet effectively?
- Is ICT perceived to be relevant to non- and limited users' everyday lives?

1.4. Significance of the study

The findings of this study provide deeper understanding of the issues that are encountered by digitally excluded members of societies, particularly as individuals in today's society are more connected than ever before. Those who do not use ICTs such as the internet, and those who use ICTs in a limited way only, are more likely to be limited in their social activities as most domains of society rapidly digitalise. To date, governments have strived to address the digital exclusion issue by putting in place a number of digital divide initiatives that provide citizens with access to facilities and digital training programs. However, there has been growing concern about the deepening of the digital divide, even though differences in internet penetration between populations continue to narrow. Currently the effectiveness of policy is not systematically measured, and policy changes are needed, along with a political environment that is conducive to more practical solutions that consider both empirical data and policy evaluation. Linking the policies and information on digital exclusion that are emerging in this rapidly digitalising society is crucial in order to provide the nexus that can ultimately form the foundation of effective policy implementation.

There is limited information available to explain why some members of societies remain offline and what they experience in today's society as a result of not being digitally enabled so they benefit from ICT use. This study listens to the voices of those who are digitally excluded and contributes information to policy makers and all entities that can assist with developing ways to prevent the social exclusion that results from digital exclusion, which can ultimately direct society towards becoming an inclusive digital society.

While considerable research has paid attention to identifying the most significant factors of non-use and the most mentioned reasons for non-use, this study explores different and unknown circumstances that underlie extended non- and limited use and the resulting exclusion that digitally excluded groups experience in their everyday lives. Qualitative approaches to collecting and analysing data are undertaken in this study, which offer deeper

knowledge of digital exclusion and provide methodological insights for the study of non-users.

1.5. Thesis structure

The remainder of this thesis is structured as follows:

It begins by providing a review of the relevant literature on the concepts of digital divide and digital exclusion, focusing on current debates on the factors and outcomes of continued non-engagement with technology. This chapter presents the shift in research attention from the access divide paradigm to the notion of effective use of the internet from a digital inclusion perspective. In the second section of Chapter Two, ICT policy as a government effort to tackle the digital divide is discussed, focusing on the evident shift in policy emphasis. The growing importance of demand-side interventions, particularly in a more digitally mature society, is discussed. Then, the importance of evidence based policy development that targets deep-rooted factors behind digital exclusion to achieve digital inclusion is discussed. In the final section of the chapter, ICT development and the digital divide in the Australian context are examined, drawing a picture of the Australian ICT environment and the digital divide status of the population as a whole. The chapter concludes by discussing the relevant research gap and reasons for conducting this research.

Chapter Three describes the research approach and methods used in this study. Document analysis was used to examine published government policies and strategies relating to broadband infrastructure and the digital divide. In-depth interviews were also undertaken with non- and limited internet users to gain insight into the underlying circumstances of non- and limited use and digital exclusion experience in their everyday lives.

In Chapter Four, the results of the policy analysis are considered. The first part of the chapter provides an overview of the digital divide policy in Australia. In the following sections, the main government documents published during the three principal periods in Australia's ICT development, the Networking the Nation (NTN) program (1997-2004), the Connect Australia program (2005-2007) and the National Broadband Network (NBN) (2009-2015), are reviewed. The findings are then described thematically according to policy analysis frames that focus on the supply-side and demand-side considerations of policies and initiatives. Finally, the observed changes in the considerations and underlying concepts of the broadband

development and digital divide policies over the last two decades are connected with the literature to demonstrate the gaps and weaknesses in digital inclusion policy.

Chapter Five presents the interview findings from non- and limited users. The findings are described thematically, focusing first on the latent circumstances surrounding non-use and the underlying circumstances of the limited users as reasons behind non- and limited use. Following this, the resulting everyday experiences of exclusion derived from four key categories of exclusion, (1) socialising (connectedness), (2) engaging in information flow, (3) access to public and social services, (4) parenting (education), that emerged from the interview data are presented. In the following section, the theoretical theme of digital exclusion and relative deprivation that emerged from data analysis is discussed, followed by an exploration of the theme of social encouragement and support, which provide insights into the nature of digital exclusion and social support resources.

Chapter Six provides an in depth discussion of the major findings of the qualitative study by considering the existing literature on the individual and social factors of technology adoption. To illustrate a deep understanding of digital exclusion among non- and limited users, the discussion considers the social and circumstantial factors behind non- and limited use derived from the interview data, which are integrated into apparent and observed reasons. Following this, the latent reasons behind these social and circumstantial factors are discussed in depth in particular, lack of social support and encouragement. Furthermore, by integrating the key categories of exclusion, the changing nature of digital exclusion in everyday life is discussed with reference to existing research on digital exclusion and social exclusion.

Chapter Seven, the concluding chapter, presents a summary of the key findings in line with the questions set out to guide this research and a brief discussion of how the approaches in this study contributed to identifying deep-rooted factors and nature of digital exclusion. The implications for digital inclusion policy are considered, and dimensions of the digitally excluded identified from a typology of technological and social support is proposed. The theoretical implications of relative digital deprivation emerged from this study also are considered. Lastly, this chapter identifies the limitations of the study, along with implications for future research.

Chapter 2 Literature Review

This chapter presents a review of the literature pertaining to the digital divide and digital exclusion. It focuses on the shift in research attention from the access divide paradigm to the notion of effective use of the internet from a digital inclusion perspective. It also discusses the literature exploring the role of ICT policy as an important strategy in addressing disparity in both access and use within a country, and the different phases of ICT development.

2.1. The digital divide in the information society

Over the last few decades, information and communication technology (ICT) has been increasingly regarded as playing a foundational role in production processes. Following the first paradigm of the agricultural society, the second stage of society was in industry and the manufacture of goods so that economic modernisation and automation were represented in the industrial society. In the post-industrial society, the provision of services and the manipulation of information are increasingly at the heart of economic production, often referred to as contributing to an “information society”, or informatisation.

Castells (2000) identifies four features of informatisation that distinguish it from the prior industrial stages: the driving role of science and technology in economic growth; a shift from material production to information processing; the emergence and expansion of new forms of networked industrial organisation; and the rise of socioeconomic globalisation. In the information society productivity and economic growth are “increasingly dependent upon the application of science and technology, as well as upon the quality of information and management, in the process of production, consumption, distribution, and trade” (Castells, 1993, p.15).

In the last few decades a revolutionary advancement of ICTs has occurred around the globe. The advent of broadband technology has provided societies with new communicative opportunities, which have improved productivity and expanded the capacity of existing processes for producing goods or delivering services. Consequently, the systems embodying these technologies have spurred economic growth. The deployment of ICT has been hailed as a crucial driver of the digital economy.

Many scholars have started to examine the role of ICTs in economic development and productivity growth at the national level (Brynjolfsson & Hitt, 2000; Greenstein & McDevitt,

2009; Kretschmer, 2012; Oliner & Sichel, 2000; Shahiduzzaman & Alam, 2014; Van Gaasbeck, 2008) as well as at a cross-country level (Colecchia & Schreyer, 2002; Czernich, et al., 2011; Fornefeld et al., 2008; García-Muñiz & Vicente, 2014; Koutroumpis, 2009). Such studies have suggested a positive link between ICT development and economic growth. The World Bank reports that for every 10 percentage points increase in the penetration of broadband services, there is an increase of 1.3 percentage points in economic growth. These studies emphasise the critical role of ICT in economic development in helping to reduce the physical distance between firms, customers, suppliers and collaborative partners. ICT enables industrial players to create new knowledge and transmit more efficiently (García-Muñiz & Vicente, 2014).

However, it has been noted that these remarkable economic outcomes have not directly led individuals to take full advantage of technologies. Despite early anticipation that technology would serve as a great social leveler and provide equal opportunity by democratising the information processes of production, dissemination, and use (Akiyoshi, Tsuchiya & Sano, 2013), there are arguments that ICT expansion may simply perpetuate existing inequalities, as the economic and social returns of using broadband differs across populations and countries (Van Dijk, 2006; Witte & Mannon, 2010). Worsening inequality has become a worldwide challenge, including in developed countries that have technically advanced infrastructure (Warschauer, 2004).

2.1.1. The early digital divide: origin and debates

The inequality of outcomes in terms of ICTs has been consistently studied along with the concept of the digital divide since the mid-1990s. The term “digital divide” was first used in an article in *The New York Times* by Gary Andrew Pole in 1995 (Molnar, 2003). Since then, the term has been used in the context of policy issues, particularly after the publication of the " FALLING THROUGH THE NET: A Survey of the "Have Nots" in Rural and Urban America " report by the National Telecommunications and Information Administration (NTIA) in 1995. The initial definition of the digital divide as the difference between those who have access to information technology and those who do not, has long been employed in literature.

Early understanding of the digital divide was largely focused on the physical availability of devices and connections and the gaps that divided specific populations of “have nots”. Much

research attempted to identify those on the wrong side of the benchmark, usually in reference to the general population. Socioeconomic and demographic factors such as income, employment, education, race, age, gender, disability and region have been recognised as determinants of ownership (Compaine, 2001; Servon, 2002). Each of these factors has been implicitly deemed to causally contribute to an individual being on the wrong side of the digital divide (Gibson, 2006). As a result, considerable attention has been given to reducing disparities among the socially and economically disadvantaged groups, such as the elderly, low income families and remote area residents, in the general population.

While the concept of the digital divide originally focused on differences between those who have access to technologies versus those who do not, it has become increasingly evident that social inequality also manifests at the level of different uses among those who have access. Warschauer (2002) describes the contextual reasons for this as: (1) a new information economy and network society has emerged; (2) ICT plays a critical role in all aspects of this new economy and society; and (3) access to ICT, broadly defined, can help determine the difference between marginalisation and inclusion in this new socioeconomic era (p.12). While it was natural and appropriate to view the digital divide in terms of a distinction between “haves” and “have-nots” at the beginning of the diffusion process (DiMaggio & Hargittai, 2001), ICT has become foundational in transitioning.

The digital divide has been described as one of the most important social inequality issues facing the information society (Hoffman, Novak & Slosser, 2001), and the term digital inequality is often used to turn attention away from the simplistic dichotomy access to ICT. The technological orientation of early digital divide research resulted in physical access being considered as an equal concept to technological access (Van Dijk, 2006). In this perspective, having access was translated into use and access to information and resources. However, an increasing number of researchers, such as DiMaggio and Hargittai, suggest that the concept of digital divide should be discussed “beyond access”. The concept should be reframed based on different contexts of use, which significantly shapes experiences of use.

2.1.2. Second level divide: beyond access towards effective use

Some researchers have begun to extend the concept of the digital divide to inequalities of skills or competencies in the use of technology. Attempting to understand inequalities in access to the internet, Hargittai (2002) considers variations in levels of skills and usage

among individuals, defining skills as the “ability to efficiently and effectively find information on the Web” (n.p.) She conceptualises the second-level divide in terms of skills and usage, which can lead to unequal benefits being accrued by internet use. Such a divide has become more evident as access is increasingly made available (Livingstone & Helsper, 2007; Park, 2012; Selwyn, 2006; Tsatsou, 2011; Van Dijk, 2005; Zillien & Hargittai, 2009). Different levels of skills result in variations in the ways of using technology, such as the internet. In order to make it most useful to particular needs, the internet should be used effectively, rather than merely available. If users cannot effectively use the internet, then merely having access does not mean that a digital divide has been overcome (Hargittai, 2002). Instead, the problem becomes more complex (Van Dijk, 2013).

Along with the second digital divide, several researchers have started proposing models in which other components of access and use are explained, such as motivation, skills and support. For example, DiMaggio and Hargittai (2001) suggest that there are inequalities in technical means, autonomy, skills, social support and purposes which significantly shape the experiences of the internet from usage to outcomes. Similarly, Lievrouw and Farb (2003) propose four basic elements of inequity that transcend physical access to resources: skills, content, values and context. In this framework, values include social support, and context is concerned with the social contexts that shape people’s information needs and interests. Both concepts correspond to social support and purposes in DiMaggio and Hargittai’s model. These models clearly demonstrate that access is not only a prerequisite for tackling the digital divide, but also that other elements are equally or even more broadly related because technology use is a matter of effective use.

Effective use has often been discussed in the literature on the digital divide as a rationale for moving beyond the “have nots” model, with emphasis being placed on access to enable social and community objectives (Gurstein, 2003). In the enabling access view, Mancinelli (2007) defines the digital divide as the gap between those who can effectively use new ICT tools and those who cannot. Indeed, earlier, Doctor (1991) noted that access to technology by itself is not enough to ensure equity, emphasising that obtaining material and support resources for effective use of access is also crucial:

Access will be of little benefit to large portions of the population, unless it is accompanied by equipment and training that allows effective use of that access. What we need then is a “right to access” in the broader sense of a “right to benefit from access.” (p. 217)

In line with this conceptualisation, Gurstein (2003) defines effective use as “the capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals” (p.6). He highlights the importance of skills that have evolved from consuming internet enabled services and internet supplied goods or information to actually participating in the production of things that are economically, socially, and politically significant for the users. In this sense, access is a necessary but insufficient condition on its own for one to be an effective user of technologies. More emphasis is given to the capability to meaningfully use internet enabled resources and tools. In other words, a supportive social structure which encompasses training facilities provision as well as social encouragement, is the key element in reducing the second digital divide.

In the early stage of research into the digital divide, Clement and Shade (2000) recognised the importance of questioning the concept of access. Clement and Shade developed an “Access Rainbow” model using a socio-technical perspective leading from physical infrastructure, such as carriage and device, and extending to software tools, content, service, literacy/social facilitation and governance. The rainbow model shows a hierarchy of conditions, but Clement and Shade illustrate the main constitutive element as being the service/content layer in the middle, since this is where the “actual utility” is most direct (p. 4). All the other layers are related to one another and are necessary conditions for accomplishing proper content/service access.

Gurstein (2003) applies the Access Rainbow model to the concept of effective use, labelling it an “effective use” rainbow (p.7). The seven components are layered and prerequisite to the effective use of technology. That is, in order for individuals to effectively engage with ICTs, not only are physical access and devices important, but tools, content and service must also be designed to be specifically effective for end users in appropriate formats. In terms of content, the last three components of effective use involve service provision, social facilitation and governance, which are vital to linking the information and services provided to end users. Public access points and support services are social support infrastructure based on public access and training program provision. The role of governance in effective use is enabling financial structure, providing a supportive legal or regulatory system, and political support which corresponds with public consultations on policy issues and assessments of social impact (Clement & Shade, 2000).

One of the benefits of considering the concept of effective use in approaching the digital divide is in forcing us to not only extend our views beyond access, but also to focus on individual agency in using technology and the core outcomes of technology adoption. Gurstein (2003) discusses how effective use considers individuals' use of technology as socially constructed behaviours and phenomena, highlighting the community and social context in which individuals belong and live as providing the most useful conceptual and methodological foundation for designing effective use. If there is a technology or service of little use in a society, particularly among certain social groups, non- and limited engagement with existing infrastructure can be understood by looking closely at the surrounding social circumstances rather than focusing on the results of an absence of access or devices.

2.1.3. Digital exclusion and social exclusion

Recent research on the digital divide has focused more closely on exclusion from digital networking and communication tools and its association with being excluded from social domains as a whole (Gibson, 2006; Helsper, 2012). Gibson (2006) recognises the status of digital exclusion, defining it as exclusion from "the best use of digital technology, either directly or indirectly, to improve the lives and life chances of all citizens and the places in which they live" (p.175). Digital exclusion has started to be recognised as a process of being socially marginalised. It has been argued that those who do not make use of technologies are becoming more and more excluded, not just from the use of technologies, but also from society as a whole, as almost all domains of society are increasingly ICT mediated (Gibson, 2006).

Van Deursen and Van Dijk (2010) point out that a considerable number of social groups are excluded from effective internet use and, as a result, their exclusion is understood as a disadvantage in different social contexts, such as employment and education. Makinen (2006) argues that excluded people in the information society are "ones who could increase their welfare and prospects by using information technology, but who do not have the chance or ability to use it" (p. 384). Social exclusion, due to digital exclusion, has emerged as a critical topic in the literature on the digital divide, with many studies attempting to identify the linkage between digital exclusion and social exclusion. Social exclusion refers to "the deprivation from goods, services and activities which the majority of the population defines as being the necessities of modern life" (Gordon et al., 2000, p. 5). Although early definitions of social exclusion were rather broad, they focused on the consequences of the associated

problems of unemployment, poor skills, low income and poor housing, thereby narrowing definitions to poverty and spatial issues (Bonner, 2006). Percy-Smith (2000) recommends overhauling such a narrow definition, suggesting that social exclusion, in fact, has multiple dimensions: economic (long-term unemployment, workless households, income poverty); social (homelessness, crime, disaffected youth); political (disempowerment, lack of political rights, alienation from/lack of confidence in political processes); neighbourhood (decaying housing stock, environmental degradation); individual (mental and physical ill health, educational underachievement); spatial (concentration/marginalisation of vulnerable groups); and group (disabled, elderly, ethnic minorities). Those who do not have access to relevant support services to address the needs above are disempowered in civil society (Bonner, 2006).

Mancinelli (2007) notes that a key distinction between poverty and social exclusion lies in their multiple dimensions. Multidimensional social exclusion is the outcome of more complex processes than poverty. As Bonner (2006) mentions, the key here is the participation in society that builds “meaning and belonging” (p. 4). De Haan (2000) also emphasises the notion of participation, defining social exclusion as “the process through which individuals or groups are wholly or partially excluded from full participation in the society within which they live” (de Haan, 2000, p. 26). He recognises that social exclusion is “a multi-dimensional concept” and “focuses on the relations and processes that cause deprivation”, whereby people can be excluded by many different sorts of groups, often at the same time (p. 26). The societal relations and processes through which people are deprived is the core focus of the social exclusion debate in this context, rather than bounded groups and their situations per se (de Haan, 2000).

The notion of social exclusion is a way of conceptualising society, including (and with a focus on) the processes of deprivation that are an integral part of that society. The mapping and monitoring of deprivation as descriptions of outcomes is important; but a social exclusion framework takes us beyond that, and identifies the processes that lead to and cause deprivation.
(de Haan, 2000, p.33)

While exclusion from economic activities has been well recognised as relating to “poverty”, social exclusion is not confined to the economic but applies to all domains of society where the quality of life is affected (Park, 2012), such as social and political activities, which are now increasingly digitally integrated.

Van Dijk (2005) mentions several important aspects of society in which ICTs play a vital role in enabling citizens to participate: economic (such as jobs), social (e.g. social contacts), political (voting and other kinds of political participation), cultural (participating in cyber-culture), spatial (being able to lead a mobile life) and institutional (such as realising citizenship rights). Van Dijk (2005) contends that unequal usage, which is contingent on motivation, physical and material access, and digital skills, may result in economic, social network, spatial, cultural, political and institutional disadvantages among some social groups. Helsper (2012) further conceptualises digital fields of exclusion as corresponding to four broad fields of social exclusion: economic (poverty, joblessness and economic capital), cultural (identity and belief), social (social networks and support and political participation) and personal (skills to take up new opportunities) resources. Helsper (2012) suggests that these fields of social exclusion can be applied to understanding the multidimensional nature of digital exclusion.

ICT development has led to increasing informatisation of society. The sharing and spreading of information through ICTs has become a daily reality, allowing users to strongly voice matters related to the public agenda, linking information to third parties, and enabling a new culture in which users have the ability to actively participate. Such changes in how information is acquired and how personal networking is built exacerbate social exclusion. When users experience ambiguity or a lack of familiarity with using new technologies, it can lead to isolation from a social group and feelings of disadvantage. As the above research shows, the digital divide is related to issues of social exclusion. In this regard, some studies have begun to focus on the digitally excluded, that is those individuals who are not online or involved in online activities and so experiencing increasing exclusion from society in many ways. The following section reviews the literature on non-users.

2.1.4. Non-users: the digitally excluded

There has always been a gap between people and communities who can effectively use ICT and those who cannot. Mancinelli (2008) argues that unequal adoption of and access opportunities with ICT excludes many from benefiting from the introduction of technologies in many fields of social life, as discussed above. The focus in research on digital exclusion is how ICT tools can be utilised to access social systems and resources, rather than on access to the technology itself.

This goes beyond the idea of “access to the technical kit” and considers the social relations around the uses of ICT and the socio-technical aspects of the emergent Information Society. Instead it is about lifestyle choice; identity creation; changes in social structure and relationships; the emergence of new working methods; changes in the economies of education and training; the creation of new communities of learners/citizens according to a societal learning paradigm. (Mancinelli, 2008, p.174)

Selwyn and Facer (2010) argue that “the issues underlying the digital divide impinge on the ICT use of individuals from all social backgrounds” (p. 6). These studies focus on the substantial proportion of “ordinary” users of ICTs who do not make the best use of digital technology.

While how people use technology can result in wide gaps in the effectiveness of their use, many researchers have started to question the existing concept of non-users, as those who do not have access to technology (Barzilai-Naho, 2006; Norris, 2001; Selwyn, 2004; Van Dijk, 2006; Warschauer, 2003). Selwyn (2006) states that “recent developments in domestic, public and community provision of new technologies mean that all but the most peripheral members of a society will have theoretical access to ICTs such as the computer and internet” (p.275).

An extensive review by Yu (2006) confirms that existing socio-economic factors associated with non-use of ICTs leads to digital exclusion. These factors include age, culture/social participation, education, family structure, gender, geography/rural-urban location, income/socio-economic status and race. According to the Pew Research Centre (2013), internet use remains strongly correlated with age, educational attainment, and household income. One of the strongest patterns in data on internet use relates to age: 44% of Americans aged 65 and older do not use the internet. Likewise, according to the OECD (Organisation for Economic Co-operation and Development) Digital Economy Paper (2011), the important factors determining individuals’ statuses as non-users or lapsed users of the internet are low income, not having children, location, age, economic inactivity and unemployment.

A few studies have begun to focus on non-users from different perspectives. According to Van Dijk (2005), present or potential non-users can be divided into four categories: intermittent users, dropouts, net evaders (those who normally live in households with an internet connection), and the truly unconnected. Other research explores factors that lead to non-use of ICTs, including a lack of financial resources to afford a connection (Martin & Robinson, 2007), a poorly educated or under-skilled background (Livingstone, 2004), a lack of motivation or perceived usefulness (Van Dijk, 2005), and “rejectionists/refusniks” (people

who consciously refuse to use ICT) (Selwyn, 2006). Wyatt, Thomas and Terranova (2002) differentiate the digitally excluded and the expelled from those who choose not to use the internet or have stopped using the internet voluntarily, perhaps because of reasons such as “boring”, “alternatives”, and “cost”. They define those who have never had access but would like to as “the excluded” and those who have lost access involuntarily because of cost or loss of institutional access as the expelled.

Collectively, Verdegem and Verhoest (2009) categorise non-users in terms of a combination of access, skills and attitudes towards ICT, suggesting the different profiles of non-users to be as follows: incapable refusers (lack of skills to master ICT and rather negative attitudes towards ICT), self-conscious indifferents (capable non-users with negative attitudes), the willing but incapable (highly motivated to use but lack the necessary skills with an access problem), skilled ICT lovers with limited access (literate non-users with positive attitudes towards ICT, for whom the main problem is obtaining access to ICT at home) and price-sensitive pragmatists (those with average ICT skills and moderate motivation but who experience barriers to technology appropriation in the household).

What is notable about Verdegem and Verhoest’s profile of non-users is that their identification of limited users considers the circumstances of the household, in which some people may not have appropriate access to technology despite possessing the skills required. Also, some family members might be digitally excluded despite having the technology required, such as home internet and a computer.

Research into non-use finds that instances of social and digital exclusion largely overlap with socioeconomic status and demographic trends. However, Selwyn and Facer (2007) mention that such an assumption can be a challenge to understanding the digital divide, proposing “to start from the premise that individuals from all sectors of society can be digitally excluded – not just those who are considered socially disadvantaged in general, or just those who make no use of ICT” (p.25). In line with this, Park, Middleton and Allen (2013) warn not to jump to the conclusion that existing social exclusion is completely identical with digital exclusion. Those who are unable to benefit from ICTs are digitally excluded regardless of their social exclusion status. Thus, a new type of social exclusion, derived as a consequence of being digitally excluded can potentially emerge in all sectors of society (Selwyn & Facer, 2010). However, while emerging issues surrounding digital exclusion have been recognised in the literature, there is little empirical data to supplement individual-level research with analysis

of changes in digital exclusion circumstances that have resulted from evolving technologies over time.

Several studies have documented internet non-users who live in internet enabled areas (Selwyn, 2006; Park, 2014; Van Deursen & Helsper, 2015), suggesting that the internet lacks relevance to their lives. Some research has recognised those who choose to stay offline voluntarily, so-called “want nots”, arguing that it is not always a case of digital exclusion, but can be digital choice where one wants to remain offline and refuses to engage in ICTs to some extent (Dutton, Helsper, & Gerber, 2009). Although the notion of a lack of relevance of computers or the internet may influence the debate around whether non-use of the internet constitutes a digital decision or digital division (Eynon & Helsper, 2011; Selwyn, 2006), a more pressing debate concerns the outcomes of continued non-engagement with technology in a digitalised world. As the ways in which products, services and information are supplied and distributed are increasingly changing from offline to online, non- or limited use of technology can negatively impact the lives of non-users.

In this context, the arguments of some researchers on ICT adoption are notable. For example, Selwyn and Facer’s (2010) definition of digital exclusion is notable: “inability for an individual to make empowered and informed choice about their use or non-use of ICT-based practices” (p.19). Marien and Prodnik (2014) contend that the reasons for non- and limited use do not relate to one's skill set, knowledge, desire or enthusiasm but instead to social structure/cultural practice and socio-economic factors in more structural perspectives, such that “there is no such thing as a free informed choice” (p.38). These researchers note the changing issues surrounding digital exclusion, highlighting informed decisions in ICT adoption and relevant social factors, which are important points in the current digital exclusion debate.

Van Deursen and Helsper (2015) highlight the importance of further research that deals with different aspects of, and reasons, for non-use in order to understand digital exclusion processes beyond the binary approach of non-use/use. In transcending a binary approach, more attention needs to be paid to the circumstances that lead to digital exclusion and the variations that exist between non-users and users (Park et al., 2013; Wyatt, 2014). In other words, there needs to be more attention given to what occurs in non-users’ daily lives, rather than simply assuming a link between non-use and digital exclusion. Digital exclusion tends to be seen as a lack of access to the benefits of technology, without looking closely at the

occurrence of the exclusion itself at the individual-level. This may lead to the view that there is no huge benefit if you are connected and use technology. However, as Warren (2007) warns, if you do not use or are not fully engaged with technology, you are left behind socially, which may increasingly affect fundamental rights, such as those relating to education and democracy.

2.1.5. New perspectives on digital inclusion

Lievrouw and Farb (2003) define the concept of digital inclusion as “the extent to which different socio-economic sectors of a society have equal opportunities to take part in the information society” (p.504). The ability to participate in the information society means both the capacity to use, and the actual extent of use of, ICT enabled services. Lievrouw and Farb argue that digital inclusion does not merely consider the accessibility of new technology to different sectors of people in a society, although this is a necessary condition, but also the actual degree to which the services enabled by ICT are useful: a reference to tangible outcomes and a reliance on the quality of the provision of content and services available online.

The concept of digital inclusion is comprehensive and covers the broad use of ICT in all aspects of social life. Mori (2010) states that OECD countries have started using digital inclusion in policy discourses “as an expression to refer to the human aspects of ICT dissemination as a public policy issue, aiming the development of information societies” (p. 48). In these countries, the matter of inequality of access to, and use of, ICT is often connected to inequality in relative economic, political, social and cultural opportunities (Mori, 2010). However, it has been argued that policies that address exclusion and the digital divide maintain a binary dichotomy (“haves vs have-nots”), and have taken a limited approach to the technological dimension, which mainly focuses on the physical availability of access and devices (Mossberger, Tolbert & Stansbury, 2003; Van Dijk, 2003; Warschauer, 2003). A market-based approach (Strover, 2014). Servon (2002) points out that such a narrow understanding of the digital divide issue results in a disconnection between policy and need.

In dealing with the issue of the digital divide from the digital inclusion perspective, it is vital to understand technology as a tool for social development in the context of individuals.

Verdegem and Verhoest (2009) argue that policy for digital inclusion should aim not only at

removing barriers, but also equally at increasing the value of ICT for end-users. Value can be added to end-users' lives by technology meeting their social needs:

The conflict between investing in ICTs and meeting basic needs can only be solved by refusing the assumption that providing technology is a goal in itself, focusing on how essential human needs, including social, cultural, economic and political needs can be better addressed using technology (Comunello, 2010, p.594).

By shifting the emphasis from technology to individuals, it will be possible to identify whether and how technologies have achieved positive economic and social outcomes in individuals' everyday lives. Nevertheless, it may not be easy to make this shift. Middleton (2012) highlights that, while assertions that broadband enables employment, education and healthcare are plentiful, there is little evidence that shows how individual usage of broadband actually results in increased engagement with the information society. She points out that one of the reasons for the somewhat uncertain relationship between broadband technology adoption and improved information society outcomes is that improved outcomes are not always easy to recognise. For this reason, Kolko (2010) calls for more research that specifically considers the relationship between investment in ICT infrastructure and tangible benefits for citizens, and assesses how, and whether, broadband uptake can lead to better social outcomes. However, we have predominantly witnessed supply-side, technology-focused policies that largely miss consideration of users' needs (Preston & Cawley, 2008). This is because there is a gap between the development of ICT infrastructure and "the ability to deliver the desired outcomes" (Middleton, 2013, p.2).

Indeed, there are different resources, other than access and devices, that enable engagement with ICT. Researchers have begun to identify prerequisite conditions of being digitally enabled. For example, Van Dijk (2005) sees the success of engagement with ICTs as being contingent on the following aspects of resourcing: temporal resources, material resources above and beyond ICT equipment and services, mental resources, social resources, and cultural resources. This framework is akin to Warschauer's (2002) four concepts of effective use of ICTs: physical resources, digital resources, human resources and social resources. Van Dijk's physical and material access encompasses Warschauer's physical and digital resources, and Van Dijk's digital skills are akin to Warschauer's human resources. Given that Van Dijk's usage concept implies continuous and regular ICT use, it can be matched with Warschauer's social resources, which include ICT use and support. These researchers clearly show that one's adoption of and engagement with ICT is complex, and involves different

individual and social resources. In particular, it is notable that social networks and support are identified as a resource required for effective adoption of ICT.

These frameworks provide evidence of what resources are required to be digitally enabled or, in other words, to be able to participate in the information society. It is argued that governmental efforts to wire their nations have not been accompanied by funding for appropriate training and content, and narrowly focus on access (Servon, 2002). This may be related to the way in which the issue of the digital divide is framed by governments. The definition of the digital divide even varies between developed nations, which results in differences in responding to the problem of the digital divide and limits the role of governments in tackling the issue (Maram & Ruggeri, 2013).

2.2. ICT policies for tackling the digital divide

A growing body of research indicates that access to technologies is not in itself adequate for promoting digital engagement among those who remain offline, nor is it able to further contribute to a true sense of effective use and digital inclusion for all. The importance of digital skills and literacy, particularly in a more digitally mature society, has been highlighted. In this context, there is a growing body of literature that discusses the role of governments from a policy perspective and notes the need to largely reconsider the focus of ICT policy on infrastructure development, placing emphasis, instead, on the importance of evidence based policy development that targets the deep-rooted factors behind digital exclusion in order to achieve digital inclusion. This section reviews existing studies on ICT policy interventions to tackle the digital divide before discussing the current debate on the supply and demand-side ICT policy interventions and critical literature on digital divide policies. The final section of this chapter explains ICT development and the digital divide in the Australian context, drawing a picture of the Australian ICT environment and the digital divide status of the population as a whole. The chapter concludes by discussing the relevant research gap and reasons for conducting this research.

2.2.1. Digital inclusion and ICT policies

As highlighted above, digital inclusion implies the broad use of ICT in all aspects of social life, including participation in the economy and the political arena. Differences in access to and use of ICT result in unequal abilities to participate in and benefit from the growing

information and communications technology available to many (Hoffman, et al., 2001). In this regard, Maram and Ruggeri (2013) recognise the digital divide to be a public policy issue, such that arguments in terms of government intervention in the form of public provision or public subsidies are relevant. They point out that “government intervention is more efficient in the sense that it is able to better capture the spillover benefits for the greater society” (p. 113). On the other hand, it is also argued that the appropriate role of government is not yet clear, and that it is advisable to wait and see whether the market is able to close the ICT gap (Mossberger, Tolbert & Tansbury, 2003). This is a perspective based on the market (e.g. commercial development and the role of providers), rather than on the technology itself.

Although it is well recognised that the digital divide is a real phenomenon, Maram and Ruggeri (2013) note that there are considerable variations in the solutions to the problem that are proposed by various stakeholders. They argue that this is because the nature of the solution is largely affected by how the problem is defined and conceptualised, which in turn directly influences the practice of policy:

Defining and setting the parameters of a particular problem aid in including or excluding specific parties and stakeholders. Thus, how the issue of the digital divide is framed largely contributes to the selection of resources called upon as part of the solution. (Maram & Ruggeri, 2013, p.115)

Such different points of view in terms of government intervention may come from different understandings of the concept of digital inclusion, and this in turn forms the basic arguments of the policy approach to confronting the digital divide (Mori, 2010). Mori (2010) outlines three different approaches to digital inclusion and social inclusion discourses and practices. The first of these is perceiving digital inclusion as equal to economic development, such that ICT dissemination requires the production and consumption of related products and services, which in turn contributes to market development. From this perspective, digital inclusion is “an engine for increasing productivities, as well as promoting better job opportunities” (p.49). The second approach is the so-called “digital inclusion as panacea”, which views digital inclusion as a means of increasing social inclusion. Lastly, there is the concept of participation in the network society, which views digital inclusion as a tool for multidimensional development in different aspects of human life. In this approach, public policies need to be participatory to ensure the social appropriation of ICT, particularly to enable marginalised individuals and communities to effectively use ICT infrastructure. Mori, however points out that there are critical underlying assumptions of these approaches, namely

that technological evolution is a consequence of natural development. It may not be the automatic step from usage to effective adoption which entails the effective integration of technology into the lives of individuals and wider society (Hilbert, 2011).

As a key national development goal in many countries, providing universal access to broadband has been considered a solution, or necessary first step, to bridging the digital divide, with many related initiatives implemented by governments, (e.g. Connecting America (United States)). However, while these policies have largely focused on narrowing access gaps (Maram & Ruggeri, 2013; Ragnedda & Muschert, 2013), they have not addressed the rift between the policies' goals and users' needs (Servon, 2002). Warschauer (2004) asserts that access to ICT for the promotion of digital inclusion cannot rest on the provision of devices or conduits alone; rather, it must entail the engagement of a range of resources enhancing the social, economic, and political power of the targeted beneficiaries. In line with this, Badasyan, Shideler and Silva (2011) highlight that policymakers should reflect on their policies for universal access to broadband and focus, not only on extending the deployment of broadband, but also on promoting adoption through the use of broadband-dependent technologies and the improvement of the technological performance of existing networks.

In recent years, researchers have added some concerns about the way in which governments and policy makers define the digital divide and the resulting policy strategies and outcomes (Hilbert, 2011; Lyons, 2011). The socio-economic access gaps that originally defined the digital divide do not adequately reflect the dimensions of the divide related to policy. A re-examination of the overall dimensions of government policy provides an idea of how government perceives and defines the digital divide in day-to-day policy making (Hilbert, 2011). Hilbert (2011) reveals that there are heterogeneous outlooks on the digital divide among countries, which can be identified by specific components of policies, such as budget allocation. The digital divide issue is multifaceted. Therefore, a holistic perspective in developing policy frameworks is essential in order to address the various aspects of the problem (Maram & Ruggeri, 2013). A holistic approach would ensure that both technical elements and social issues are equally emphasised and effectively integrated (Shin & Kweon, 2011).

In recent years there have been continued calls for another approach to ICT inclusion in regard to ICT policies and the role of government. Kelly et al. (2009) contend that governments will need to move towards "pull" strategies aimed at promoting digital literacy,

establishing an enabling environment, including an appropriate legal framework, and fostering the development of applications, including local content (p.3). While governments have traditionally played a “push” role in ensuring the right environment for the provision of ICT infrastructure and the development of the domestic ICT sector, demand-side interventions have increasingly been recognised as crucial to government attempts to foster ICT diffusion (Kelly et al., 2009; Maram & Ruggeri, 2013). In the following section, demand-side policy will be discussed by drawing on recent studies that note its growing importance.

2.2.2. Digital divide policy gap: supply- and demand-side policies

Most developed countries recognise the critical role of ICT infrastructure in economic development and have formulated ICT strategies accordingly, including national broadband plans (Ruhle, Brusica, Kittl & Ehrler, 2011). Therefore, most governments of developed countries have put national broadband policies into practice to promote ICT deployment and adoption. Governments have sought to complement supply-side policies that focus on building infrastructure via demand-side efforts that seek to drive demand for telecommunications access and services (World Bank, 2012) and also respond to growing demand. While supply-side policies are related to a push for ICT coverage and availability via the provision of resources to support operators and infrastructure construction, demand-side policies refer to efforts to boost the use of telecommunications and online services by raising awareness of their possible benefits, as well as making them more affordable and attractive to potential users (Cheng, 2014; Belloc, Nicita & Rossi, 2012).

Demand-side policies aim to increase broadband demand by providing greater availability of public services, such as e-government, education and health, as well as increasing the quality of broadband services, such as speed, reliability and security (Florence School of Regulation (FSR), 2011). Raising awareness of the benefits of broadband services among households and businesses, such as by supporting IT education and e-commerce, are included along with policy on digital literacy (FSR, 2011). Providing public subsidies for community technology centres or public points of access to the internet in libraries and schools is a type of demand-side policy especially focused on digital literacy development. Provision of incentives and subsidies to individual consumers or target groups can increase adoption in the initial stage of diffusion when combined with demand aggregation policy. The aim is to coordinate the potential demand of consumers to bring about efficient resource allocation and obtain

economies of scale in order to increase the profitability of network rollout (Belloc et al., 2012). Cheng (2014) explains that governments all over the world have intervened on the supply- and/or demand-side in order to stimulate the penetration rate, but there are differences in the policies and points in time adopted by countries.

Various policies have been implemented by different countries, but these have largely focused on increasing the supply of ICT in order to achieve broader social and economic goals. The demand-side of ICT has not been considered sufficiently (Cheng 2014; Kongaut, & Bohlin, 2015; Youtie, Shapira & Laudeman, 2007). They are considered a useful, although not essential, component of broadband policy plans (Belloc et al., 2012). However, studies have started to recognise that the mere availability of broadband connections may not be sufficient to stimulate effective adoption. Instead, they emphasise heavily the crucial role of demand-side policy and suggest that a combination of demand- and supply-side policies would be more effective than adopting only supply-side measures (Youtie et al., 2007) or only demand-side policies (Cheng, 2014).

More importantly, Belloc, Nicita and Rossi (2012) reveal that while both supply- and demand-side policies have a positive effect on broadband penetration, the relative impact depends on the actual stage of broadband diffusion—only demand-side policies have a significant positive effect in an advanced stage. In the same vein, Broadband strategies handbook (World Bank, 2012) highlights the importance of demand-side interventions, not only in the early stages of broadband market development but also in a more mature broadband market, in which some potential users may not be taking advantage of the benefits offered by broadband (p.247).

The OECD (2011) identifies one of the significant challenges of developing national broadband plans has been devising policies that overcome the barriers to broadband adoption for those with no experience of computers, who may be lacking in digital literacy and who may see no reason to use broadband (OECD, 2011). This challenge has required governments to develop a range of new programs and interventions to complement the economic measures designed to improve infrastructure provision. In this context, demand facilitation or stimulation becomes critical to boosting the use of broadband: there is a need to raise awareness of its possible benefits, as well as making it more affordable and attractive to potential users. In particular, the relative significant impacts of particular stages of broadband diffusion indicate the important role of demand-side policy.

Some researchers acknowledge the relative impact of supply-side and demand-side policy in the different phases of development by observing different phases of ICT development and the resulting strategies that lead to the formulation of policies and regulations. Kim, Kelly and Raja (2010) identify three different stages of broadband development that prioritise goals and strategies: promotion, oversight, and universalisation. For example, in the universalisation phase, policies for expanding universal service programs to include underserved communities, constructing community access centres, and providing subsidies for poor households to buy user devices are strategies related to the users' dimension, while in the promotion phase, reducing the cost of networks and devices and delivering digital literacy programs are emphasised. Oversight supports growth in access by ensuring competition among facilities and service providers, when broadband is marketable.

There is further research showing the relative impact of socio-demographic barriers on take-up depending on the particular stage of broadband diffusion. Lin and Wu (2013) identified determinants of broadband adoption by re-examining existing socio-demographic determinants, and confirmed these key factors and using more complete panel data from OECD countries. They examined and compared determinants in different stages segmented by adopter categories. The results reveal different determinants in different stages.

The results reveal that determining factors of broadband adoption are different in different stages (Lin and Wu, 2013). For example, the authors explain that income, education, and content are more prominent in determining broadband adoption in the innovator and early adopter stage, whereas broadband price more significantly determines adoption in the late majority and laggard stage (see Lin and Wu, 2013). In particular, this study emphasises that in the last stage of adoption, those who are less privileged in social and economic status are more likely to be delayed in their adoption.

This study provides insight into the dynamics of broadband diffusion, and clearly shows the necessity of different strategies for the major potential adopters in each stage, in particular, the importance of the role of government in increasing demand for broadband services. This study suggests that countries in Stage 3, such as Australia, Japan, South Korea, New Zealand, the UK and the US where there is higher broadband penetration, should tailor different strategies for promoting broadband development and focus on the demand of the late majority and laggards who are mostly of below average social status and who tend to have

less opinion leadership and financial capacity, rather than implement the same strategies over the diffusion process.

Mancinelli (2007) illustrates the development stages of digital inclusion policies by adopting Molnar's analytical model which is based on the concept of the diffusion of innovation. According to Molnar's (2003) diffusion model of innovation regarding the use of ICT means, there are three stages in the digital divide: the access divide in early adoption, the usage divide in the take-off stage; and the divide stemming from quality of use in the saturation stage. The difference between those who have access and those who do not is recognised in the first stage of ICT diffusion. In the second stage, as ICT take-up grows, the difference between users and non-users is recognised. Once ICT penetration reaches the stage of saturation, in which penetration is practically complete and growth is stagnant, the main concern becomes inequality in ICT use resulting in differences between types of users and also types of access. Mancinelli (2007) evaluates this model as particularly useful in understanding the different types of digital divide, as different social, cultural and economic factors shape the process and features of the digital divide. Empirica (2006) notes that in the saturation phase of ICT diffusion, only the smaller group of late adopters or laggards is still left uninvolved and growth rates decline; the majority of late users become involved in the take-off phase when prices fall and insecurities are addressed.

Mori (2010) stresses the importance of recognising "digitally excluded" individuals as those who are not comfortable with ICT equipment and content, even when access to the infrastructure aspects of ICT are increasingly improving. She argues that ICT tends to be designed for privileged elite groups, and may therefore not correspond to the expectations and abilities of those who suffer from other types of social discrimination. Ultimately, this can result in deepening inequality of opportunity between the haves and have-nots. In this sense, a digital divide policy should aim to tackle social exclusion among marginalised social groups, rather than fill the gap in ICT adoption (Warschauer, 2003; Warschauer & Newhart, 2016; Mills, Stornaiuolo, Smith & Pandya, 2017) To accomplish this, it is necessary to focus on the transformation, not the technology (Lyons, 2011). By doing so, it is possible to identify whether and how technologies have achieved positive economic and social outcomes in individuals' everyday lives. The importance of demand-focused policy and strategy for tackling the digital divide will be discussed as increasingly critical in ICT ubiquitous societies, in the following section.

2.2.3. The importance of on-the-ground policy and strategies to bridge the digital gap

Since 2011, the profile and importance of digital inclusion has evolved rapidly. Technology, and the benefits of using it, continues to develop apace. This threatens to widen the digital divide between the active users who can increasingly exploit ever improving technologies, and those that continue to struggle to overcome the barriers to getting online. These digitally excluded people are in danger of being left behind in society, as more and more services, including vital public services, go online.
(Digital Inclusion Delivery Plan, 2014, p.2)

The Welsh Government has developed a strategic response to the persistently high number of digitally excluded adults in recognition of their increasing exclusion from society with the rapid pace of technological change. The government has made several observations that set out key tasks and expected outputs and outcomes necessary for reducing digital exclusion levels in Wales. In doing so, it has recognised the nature of evolving digital technology and its consequence, growing digital exclusion. Furthermore, with the continued development of technology and its increased use across society, the government has recognised the need to revise its prior plan for digital inclusion to reflect how digital inclusion has evolved, the progress that has been made in tackling it, and what more needs to be done across society to ensure citizens are not left behind in the digital age. In particular, the government notes the growing need to be able to use the internet in ways that enhance life and contribute to overcoming disadvantage exists not just among members of socially disadvantaged groups, but also among all citizens, as “digital” has increasingly become the preferred means of conducting affairs in many sectors of society. This approach to digital inclusion enables the identification of the digitally excluded using a broad perspective and, therefore, takes into account actual needs in order to devise effective and practical policy practices for digital inclusion.

In line with this, Selwyn and Facer (2007) argue that individuals from all sectors of society can be digitally excluded – not just those who are considered socially disadvantaged in general, or just those who do not utilise ICT. Selwyn and Facer argue that the digital divide continues to be an important social issue, and requires the intervention of policy makers and other concerned stakeholders in the information society and knowledge economy. Demand-side efforts are particularly relevant to digital inclusion.

In order for public intervention to be able to achieve digital inclusion and address persistent digital exclusion among citizens, Selwyn and Facer (2007) conclude that the fundamental

solution lies in governments targeting the deep-rooted factors that directly or indirectly cause digital exclusion. Lehr, Bauer and Clark (2013) also recognise that along with universal infrastructure provision, identifying prospective problems that may require future intervention is crucial to effectively formulate, target and enforce communication policies. Wong, Law, Fung and Lee (2010) note that the first step in tackling the digital divide or promoting digital inclusion is to have a better understanding of the problem and locate target areas for action. Government for the Third Millennium (Gov3, n.d.) identifies a strong evidence-based approach to understanding the digitally excluded population is one of the core requirements for digital inclusion, along with a holistic and cross-sectoral approach which addresses all the drivers of digital inclusion. Taken together, the key to digital inclusion is understanding the digitally excluded, in other words, both understanding the factors underlying the circumstances in which digitally-excluded individuals persistently remain offline, and what it means to be digitally excluded. It is worth remembering that the digital divide is not a static concept, as technology evolves over time. This has been already observed in the literature as it shows the different phases of ICT development and the resulting changes in the significance of relevant components of digital inclusion, such as access, use and awareness.

DiMaggio and Hargittai (2001) pointed out that research questions and methods appropriate for illuminating distributive issues are different now than they were at an earlier stage of the internet's diffusion. Furthermore, although the same questions are of concern, outputs may now be different than in the earlier stage of the internet, as society is now more digitally mature. Hearn et al. (2004) argue that supply-driven ICT projects are one of the reasons for the stalling and failure of ICT projects in particular regional areas, and criticise failures to understand the needs and circumstances of communities where residents are not significantly involved in using ICTs. More specifically, such strategies have largely failed to understand the evolving digital divide, as well as failed to capture deepening and broadening digital exclusion among non-users and users who do not effectively engage with ICT through different phases of ICT development. There are significant numbers of people who are prevented from participation through digital technologies, notwithstanding their growing need, as "digital" increasingly becomes the preferred method in many sectors of society (Welsh Government, 2014). According to Servon (2002), digital inclusion may not be achievable without holistic policy intervention; it must play a key role in tackling the deep-rooted factors of digital exclusion first.

All of these factors – cost, infrastructure, discrimination, policy and culture – interact with each other to keep certain groups from being able to participate fully in the information society (p.11).

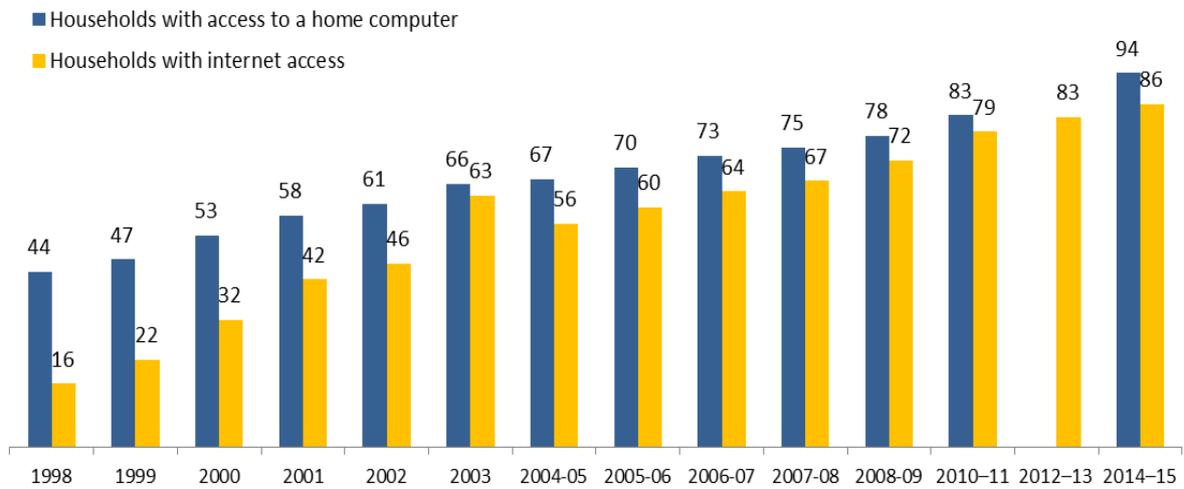
2.3. The Australian context

This section establishes the motivation for understanding Australia’s ICT development and digital divide status. In the first section I discuss ICT development in Australia based on domestic and international data, including from government agencies’ reports, national statistical data and international organisations’ reports. By looking through data related to ICT development, we can draw a picture of Australian ICT development and how it is placed compared with other nations, especially OECD countries. In the second section, the current status of the digital divide in Australia is examined mainly based on “Household Use of Information Technology” data which is annually collected by the Australian Bureau of Statistics (ABS). Data includes internet access and use as well as online activities among Australians aged over 15, allowing for understanding of the extent to which disparity in use of the internet for different purposes exist among the population.

2.3.1. ICT adoption in Australia

According to the latest ICT indicators in “Household Use of Information Technology” (ABS, 2016), the proportion of households in Australia with access to a home computer was 94.0% and the percentage of total households to have internet access was 86% in 2014-15 [Figure 2.1]. The proportion of individuals using the internet reached 84.6% in Australia in 2014 [Figure 2.2].

Figure 2.1 Computer and internet access (1998-2015)

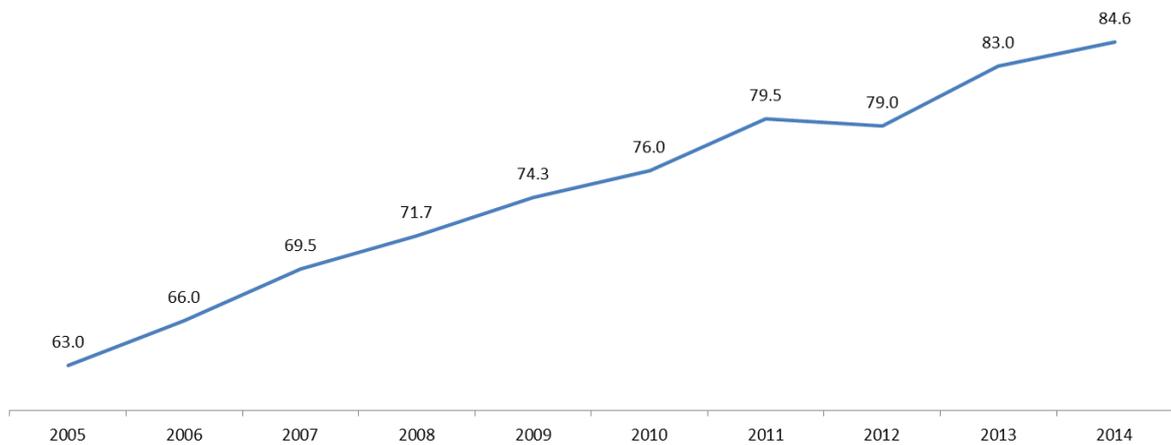


Source: Australian Bureau of Statistics (ABS) 'Household Use of Information Technology, Australia' (2016)

* In 2012-13, data on households with access to a home computer is not available

* Australian Bureau of Statistics (ABS) Includes internet access through any type of connection including ADSL, fibre, cable, wireless, satellite and mobile broadband (3G/4G)

Figure 2.2 Percentage of individuals using the internet (2005-2014)



Source: Australian Bureau of Statistics(ABS) 'Household Use of Information Technology, Australia'

* Australian Bureau of Statistics (ABS) Includes internet access through any type of connection including ADSL, fibre, cable, wireless, satellite and mobile broadband (3G/4G)

In Australia, DSL (fixed-line) and mobile (wireless) are the most common forms of internet service. Dial up access is in the process of disappearing [Table 2.1]. Mobile broadband access has increased rapidly and displaced DSL or hybrid fibre access. The OECD (2011) reports

that the strong uptake of 3G mobile broadband services reflects the success of mobile carriers in rolling out 3G mobile broadband services, to the extent that Telstra claims 99% coverage of the Australian population, Optus 97% and VHA (Vodafone-Hutchison Australia) 92-95%. It is worth highlighting that this percentage does not represent the landmass coverage: the 99% who have access at home in cities are still likely to have connectivity issues when it comes to mobile broadband outside of urban areas.

Table 2.1 Internet subscribers by access connections³ ('000)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Dial-up	1,566	1,087	784	569	439	227	182	95	90
Broadband	3,936	6,402	7,814	10,338	11,597	12,131	12,300	12,667	13,207
DSL	3,936	4,171	4,212	4,493	4,632	4,787	5,065	5,106	5,032
Cable	-	-	-	881	917	934	946	996	1,029
Fibre	-	-	13	31	52	115	203	420	960
Satellite	-	90	111	106	94	93	80	69	62
Fixed wireless	-	97	25	34	30	49	50	-	83
Mobile wireless	-	2,024	3,453	4,786	5,862	6,150	5,954	6,004	6,039
Other	-	20	-	7	10	3	2	-	1
Mobile handset*		-	-	15,190	16,192	19,645	20,567	23,652	24,818

Source: Australian Bureau of Statistics (ABS) 'Internet Activity, Australia' (2016)

* Total subscribers with internet access connections via a mobile handset

In terms of fixed-broadband subscriptions, such as DSL, cable and fibre, it appears that all take-up rates slow as they near saturation since 2008, that is since the National Broadband Network (NBN) initiative was announced [Table 2.2].

Table 2.2 Volume of data downloaded by type of access connection, for ISPs with more than 1,000 subscribers (%)

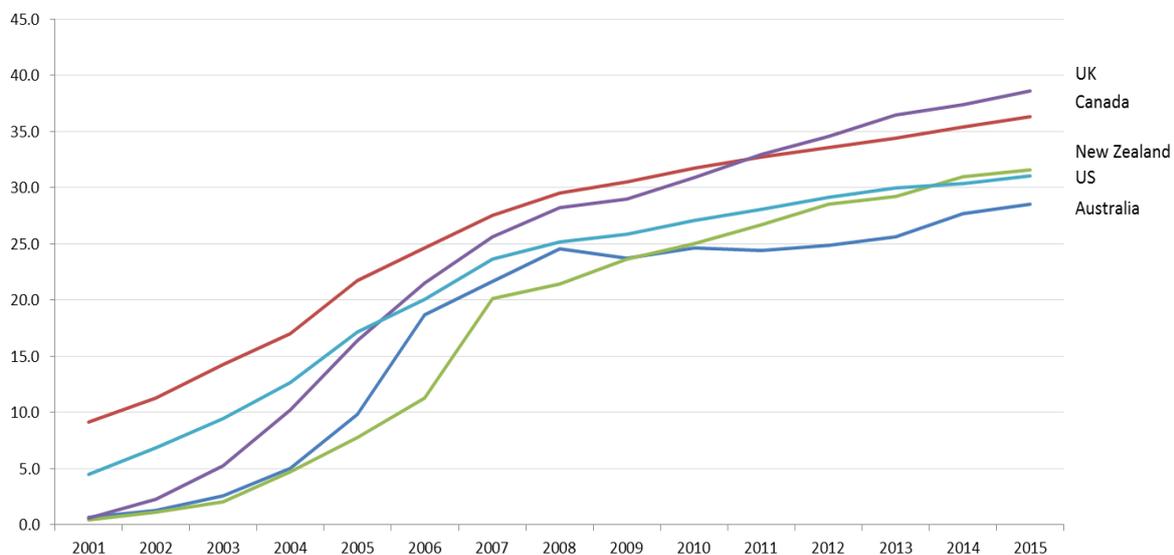
	Jun 2009	Dec 2009	Jun 2010	Dec 2010	Jun 2011	Dec 2011	Jun 2012	Dec 2012	Jun 2013	Dec 2013	Jun 2014
Fixed line	-	89	91	91	93	93	94	95	96	96	97
Wireless	-	11	9	9	7	7	6	5	4	4	3
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Australian Bureau of Statistics (ABS) (2016)

³ Type of connection (ABS, 2015): Dial-up (internet via a dial-up modem and requires the exclusive use of a phone line), Broadband (internet connection with an access speed of 256kbps or higher; Broadband is separated into fixed-line/wired (for example, DSL, cable and fibre) and wireless (for example, satellite, fixed and mobile wireless), DSL (Digital Subscriber Line, a family of technologies that provides digital data transmission over the local telephone network), Cable (Connection via a coaxial cable or Hybrid Fibre Coaxial (HFC)), Fibre (Broadband network architecture that uses optical fibre for the 'last mile' or 'access network' technology), Satellite (Internet access provided through a satellite which acts as a microwave relay station, receiving signals from a ground-based station), Fixed wireless (A terrestrial point-to-point microwave or radio link, generally building to building or tower to building, which allows subscribers within the receiving building to access the internet), Mobile wireless (An internet connection which provides short range, high data rate connections between mobile data devices and access points connected to a network)

It is evident especially when compared with other OECD countries, such as Canada, New Zealand, the UK and the US [Figure 2.3]. The OECD (2011) notes that Australia's broadband uptake is relatively slow, with Australia ranking 18th out of 31 countries in terms of proportion of fixed broadband subscribers. Australians also pay more for broadband than most OECD countries - in the case of average subscription prices, Australia was the fifth most expensive overall. The market structure and conditions in Australia are distinct from countries that were early leaders in the take up of broadband, particularly those with highly concentrated population centres that could be wired at relatively low cost. Australia is one of the least densely populated countries in the world, and most of Australia's population is concentrated on coastal urban areas (see World Population Review (2017), Australia Population 2017). Australia's geography makes it particularly challenging to ensure that public infrastructure and service provision are provided, including telecommunications (OECD, 2015). The provision of broadband services to dispersed population over a large geographical area remains a challenge, both in terms of affordability and ensuring internet reliability (International Telecommunication Union (ITU), 2013).

Figure 2.3 Fixed-broadband subscriptions

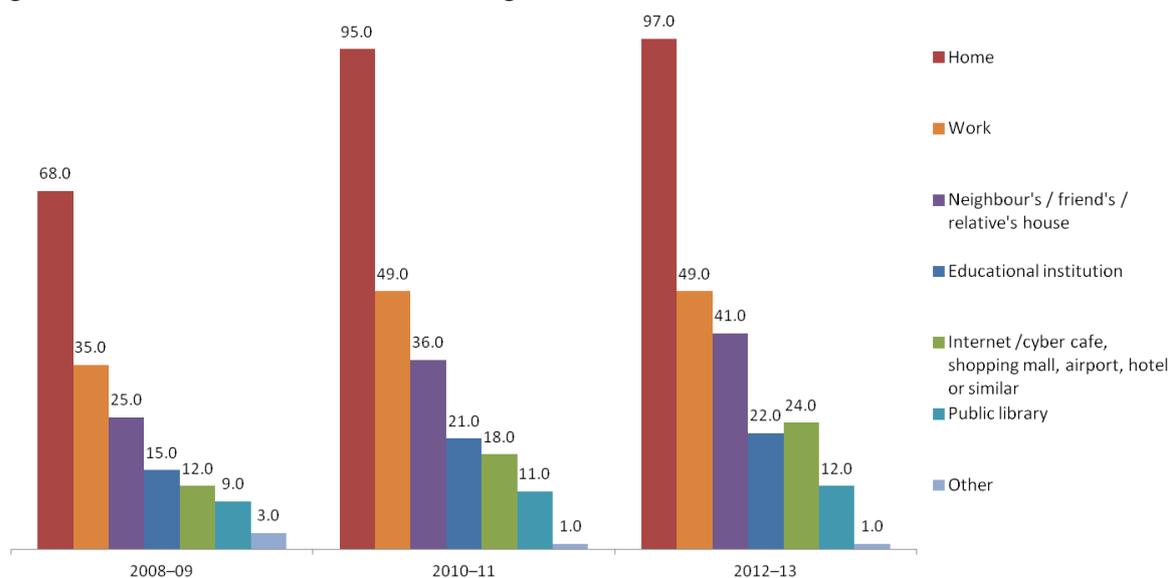


Source: ICT Data and Statistics (IDS) (2016)

However, Australians have an increasing need for data downloaded by fixed-line broadband. The overall volume of data downloaded in the three months ending 30 June 2014 increased by 16% to 996,225 terabytes compared with the three months ending 31 December 2013. Data downloaded by fixed-line broadband (963,429 terabytes) accounted for 97% of all internet downloads in the three months ending 30 June 2014. Over the year, the volume of

data downloaded by fixed line broadband showed a 53% increase. The vast majority of internet users in Australia access the internet at home [Figure 2.4]. On the one hand, the percentage of internet users of public and shared access facilities, such as at another's house, internet cafés or shopping malls, has steadily increased. This indicates that Australians are increasingly exposed to internet use.

Figure 2.4 Location of internet access among internet users (2008 – 2013)



Source: Australian Bureau of Statistics (ABS, 2016) 'Household Use of Information Technology, Australia, 2012-13'

More than half of Australians participated in banking (61.3%), social networking (60.9%), purchasing goods or services (51.6%) and entertainment (50.6%) online in 2014-15 [Table 2.3]. However, only 18.4% of Australians used the internet for accessing health services, and 21.5% participated in formal educational activities online.

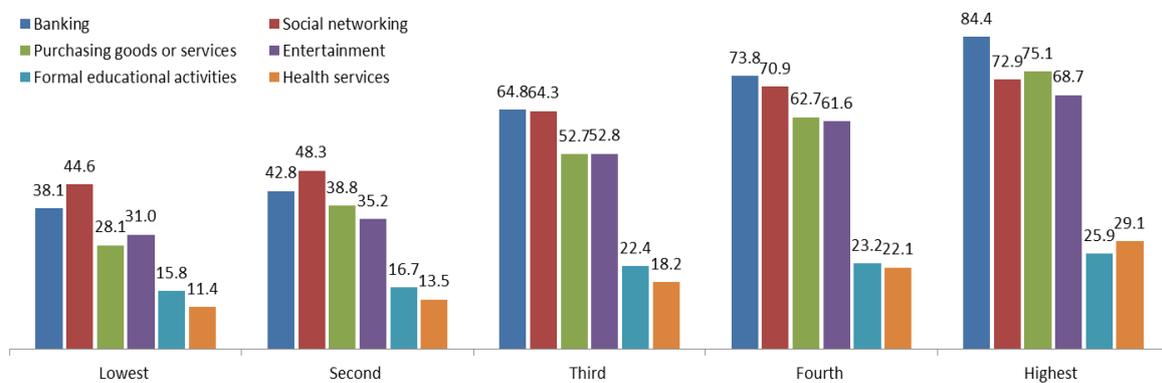
Table 2.3 Australian online activities

	N	%	
Internet users	Banking	11,483,500	61.3
	Social networking	11,411,600	60.9
	Purchasing goods or services	9,672,700	51.6
	Entertainment	9,474,000	50.6
	Formal educational activities	4,031,700	21.5
	Health services	3,446,900	18.4
Internet users	15,839,200	84.6	
Internet non-users	2,894,300	15.5	
Total	18,731,200	100.0	

Source: Australian Bureau of Statistics (ABS, 2016) 'Household Use of Information Technology, Australia, 2014-15' (all respondents are aged 15+)

Figure 2.5 presents variations in the degree of online activities among five household income quintiles. In general, the higher the household income, the greater the involvement in online activities. However, a relatively small gap in internet use for education and health services is notable between the lowest and highest household income groups. In some ways, this implies that either utilising the internet for education and health services may be rather less influenced by socioeconomic factors, or the demand for internet use for such purposes is generally low. However, in light of relatively lower rates of use in general, this may also show that more relevant content and resources are required for low income communities as a whole, which is well identified in literature on the digital divide in low income communities. (Araque et al., Hollingworth, Mansaray, Allen & Rose, 2011; Powell, Bryne & Dailey, 2010).

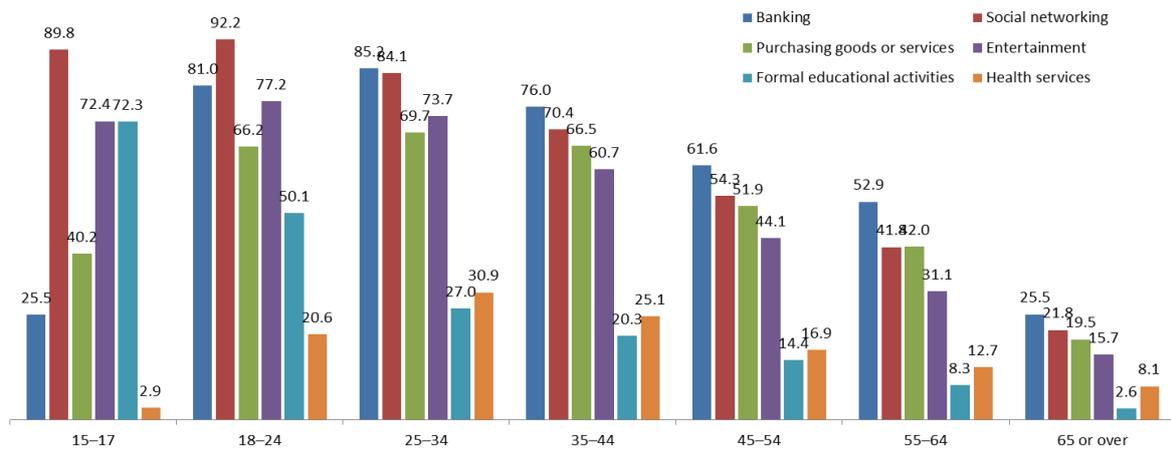
Figure 2.5 Online activities by household income quintile (%)



Source: Australian Bureau of Statistics (ABS, 2016) 'Household Use of Information Technology, Australia, 2014-15'

Looking closely at online activities by age group [Figure 2.6], the relatively low degree of internet use for all activities in general among Australian aged 65 years and over is hardly surprising. However, it is also notable that the majority of Australians aged 15 to 34 uses the internet for social networking, which explicitly shows social networking online is pervasive in the lives of this age group. For the elderly, although they are less likely to do social networking online in comparison to younger Australians, it is notable that social networking is the second most popular activity among Australians aged 65 or over.

Figure 2.6 Online activities by age group (%)



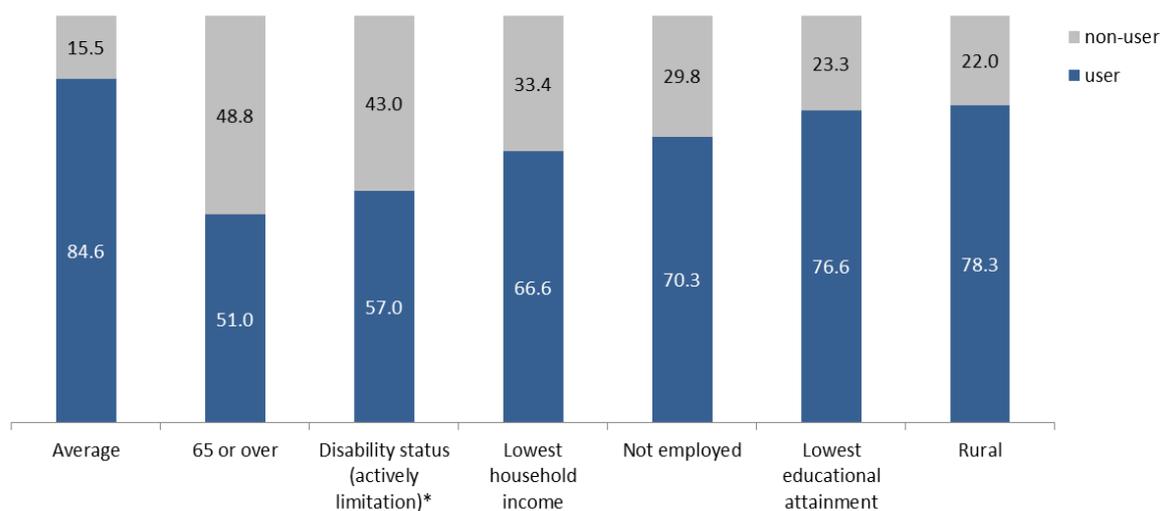
Source: Australian Bureau of Statistics (ABS, 2016) ‘Household Use of Information Technology, Australia, 2014-15’

2.3.2. Status of the digital divide

2.3.2.1. Internet access

In Australia, the ABS has been monitoring technology access and use since 1996, reporting on developments in its annual report “Household Use of Information Technology”. In 2001, the ABS National Household Census supplemented socioeconomic and geographic variables and started to measure differences in computer and internet use among people from Indigenous or non-English speaking backgrounds, the elderly, and the unemployed (Notley & Foth, 2008). The term digital divide, which was used first by the ABS in its report in 2001, “Australia online: How Australians are using computers and the internet”, was defined as “the degree of exclusion from the information society” (Lloyd & Bill, 2004). According to the report, groups less likely to have access to the internet and computers were Indigenous Australians, remote Australians, less educated, lower income, the disabled, and single parent-households. The 2014-2015 Australian National Household Census (2016) showed a difference [Figure 2.7] in internet use among Australians according to socioeconomic and geographic factors. In particular, those over 65 made up the highest proportion of Australian non-users, whereas people living in rural regions accounted for the lowest proportion, although it is still higher than the average.

Figure 2.7 Internet users and non-users (%)



Source: Australian Bureau of Statistics (ABS, 2016) 'Household Use of Information Technology, Australia, 2014-15'
 *for Disability, 2011-2012, all respondents are aged 15 +

2.3.2.2. Internet access trends by different social groups

In order to analyse internet access trends by different social groups, data was compared between 2004-05 and 2014-15. First, for all age groups, internet access increased from 2008-09 to 2014-15, but growth was strongest for older Australians, causing the age distribution to become more even. [Table 2.4] The proportion of internet use among Australians aged over 65 increased threefold – from 17% in 2008-09 to 51% in 2014-15. A similar trend was also observed in the lowest personal income and educational attainment groups, as well as among the unemployed. As well as the increase in internet access, it is important to stress that the demand for internet use among marginalised groups such as the elderly, low income, low education and unemployed, significantly increased over the last few years. Groups today are required to use the internet more than they were in 2008-09. It appears that the gaps between the groups used to define the digital gap have been narrowed; however, significant numbers of people are still left uninvolved online. Furthermore, it is also notable that considerable numbers of people in social groups who are now users were in fact late adopters for many reasons. This suggests that, as Australia becomes a fully-fledged information society, there has been a shift from an access divide paradigm to the effective utilisation of available technology for the entire population, but those who are online are having significant variations in user experiences.

Table 2.4 Comparison of internet access (%) by social group (2008-9 and 2014-15)

		2008-09	2014-15
Age	18–24	86	98
	25–34	80	96
	35–44	75	94
	45–54	68	87
	55–64	49	81
	65 or over	17	51
Education	Bachelor degree or above	93	96
	Advanced diploma or diploma	89	93
	Certificate	76	85
	Year 12 or below	64	77
Employment	Employed	77	93
	Not employed	37	70
Income	Less than \$40,000	55	78
	\$40,000–\$79,999	81	92
	\$80,000–\$119,999	91	97
	\$120,000 or over	92	97

Source: Australian Bureau of Statistics (ABS, 2016) 'Household Use of Information Technology, Australia, 2008-09 and 2014-15'

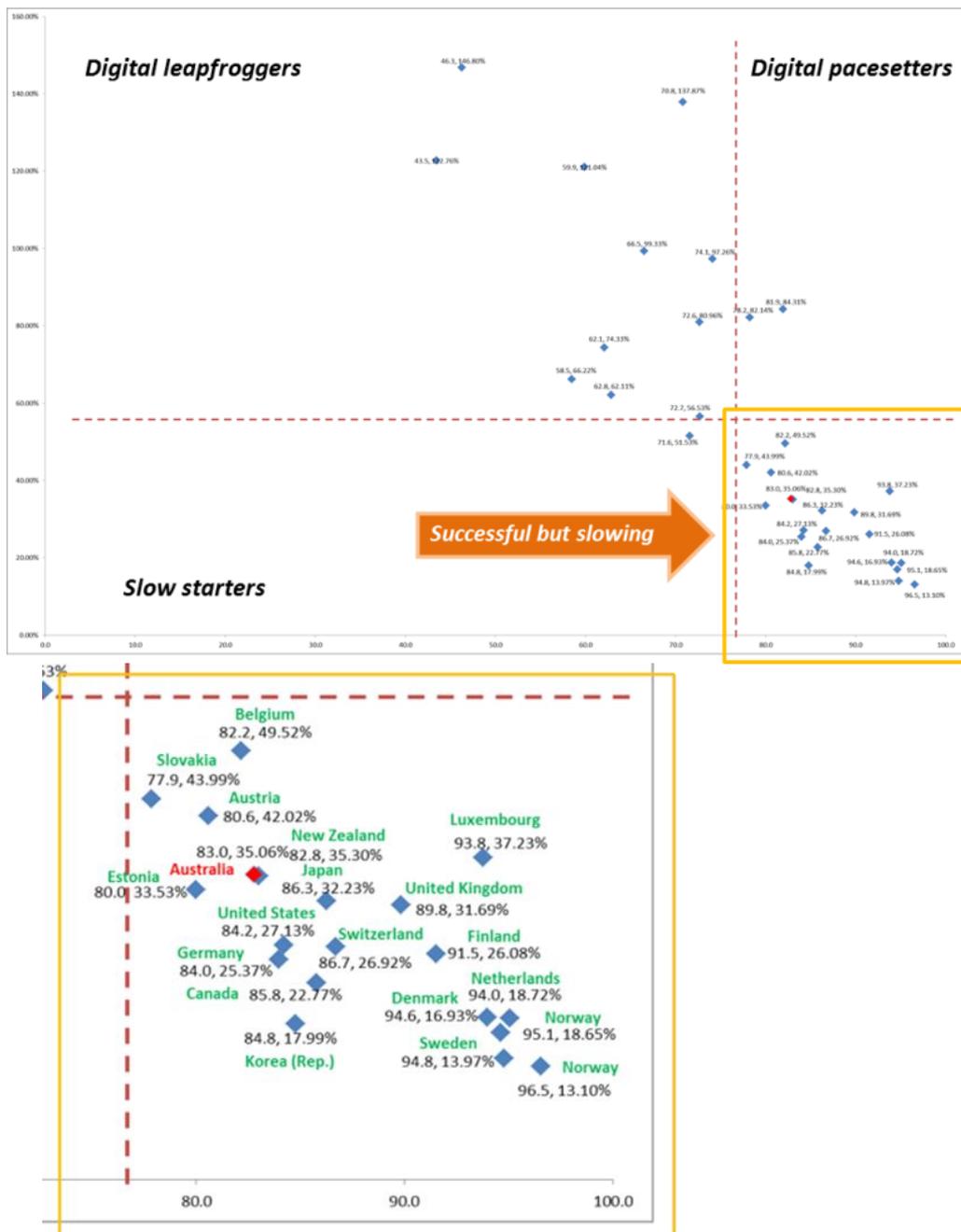
Looking at changes in activities online over the last few years, there has been increasing engagement in transactional activities online, such as paying bills or banking online (59.7% in 2012-13, 61.3% in 2014-15), and social networking activities (54.8% in 2012-13, 60.9% in 2014-15), which are the most popular online activities among Australians. In particular, it is notable that more than half of Australians are now involved in social networking online, and that this proportion is increasing. Also, entertainment activities appear to be growing in general. This trend suggests that digital leisure cultures are increasing, such that more and more people are connected to each other and enjoy digital entertainment.

However, while observing a growing use of the internet in different activities, it is notable that the majority of Australians still do not utilise public services online, particularly health services, which have been recognised as one of the key sectors to be delivered online by the Australian government, in particular since rolling out its largest infrastructure project, the NBN. Although 84.6% are identified as internet users according to the Australian National Household Census (2014), data on internet use by activity shows that there are still a significant number of people who do not use the internet for public service seeking and education, both of which have been increasingly moved online to deliver associated content and resources.

Australia's federal Digital Transformation Office (DTO, former Digital Transformation Agency, DTA), established in January 2015, claims to be "transforming government service delivery to better meet the needs of all Australians". It also claims that "every day, more Australians choose to interact with government on their mobiles, tablets and computers rather than face-to-face or over the phone" (Newman, & Gurstein, 2016, n.p.). Given that still considerable number of Australians are not engaged online to some extent, how to include the rest of the non-user population without the exclusion of anyone via a more efficient government service delivery system is crucial to the digital inclusion goal of the Australian government.

As discussed in the previous section, Gov3 identifies four categories of digital inclusion by mapping the two components of the country's internet statistics: internet penetration, and growth rates in internet penetration. According to the Gov3 framework, internet adoption in many OCED countries has been previously successful but has stalled over the last decade because of saturation, as shown in Figure 2.8. This highlights that some leading countries are now beginning to lag behind other leaders in terms of growth. And for those with lower levels of internet penetration, there are significant differences in growth levels. Australia is categorised in the "successful but slowing" group, with high internet penetration but a rather slow growth in internet subscriptions among the population. This Gov3 framework is analogous to Molnar's three types of diffusion state discussed in the previous section. In particular, the stage of saturation, in which penetration is practically complete and growth is stagnant, is akin to the dimension of "successful but slowing". In terms of Molnar's digital inclusion framework, Australia is now in the phase of quality of use/secondary digital divide, whereby there is greater consideration of late adopters and laggards who are still left uninvolved in the hope of achieving digital inclusion for all.

Figure 2.8 Internet penetration and growth among OECD countries



Source: ITU (2014)

2.4. Conclusion

The digital divide needs to be redefined to allow for a broader approach that goes beyond infrastructure deployment and the creation of an enabling ICT environment. Such a redefinition should be applied to government policy frameworks that facilitate ICTs and stimulate user adoption. According to the literature on ICT development and strategy, government policies play a crucial role in supporting and nurturing the production, development and diffusion of ICT, and demand-side interventions should be considered as a useful and essential component of ICT policy plans. Kelly et al. (2009) highlight that “governments need to move towards pull strategies aimed at promoting digital literacy, establishing an enabling environment, and fostering the development of applications, including local content” (Kelly et al., 2009, p. 3), so that the digital divide is approached more comprehensively than merely ensuring the provision and development of ICT infrastructure. That is, digital divide policies should recognise the importance of balancing the universal provision of technologies with desired outcomes in order to realise digital inclusion.

Many studies have noted policy concerns relating to how governments and policy makers define the digital divide. However, this discourse has not been supplemented by sufficient empirical and evidence-based research to provide the new insights needed for policies. A re-examination of the diverse dimensions of both the supply-side and demand-side government policy gives an idea of how governments perceive and define the digital divide in policy making. An identification of the continuing role of ICT policy can provide a better understanding of the nature of the existing perspective in practice and guide policymakers’ choices when selecting the most effective strategy to reach tangible outcomes in addressing the digital divide.

Researchers point out that a limited methodological approach in digital inclusion research (Helsper, 2012; Loader & Keeble, 2004) has resulted in little understanding of digital inclusion. This review of the literature on the digital divide and digital exclusion reveals that non- and limited users have not received enough attention. Existing research on the digital divide focuses heavily on the characteristics of individuals who are already using ICTs. However, more recently, the importance of studying those who do not use technology has been emphasised, and assumptions about users and non-users in previous research have been challenged. Gibson (2006) highlights a gap in the digital divide literature resulting from a

lack of both empirical research on digital exclusion and more nuanced research on reasons for the use or non-use of ICT among excluded groups. It is suggested that non-user studies should focus on societal factors and the sociocultural contexts of individuals and social groups in order to deepen understandings of what leads to digital disengagement. This implies research into not only the use of ICTs but also the breadth of use and involvement in different online activities in everyday life (Helsper & Eynon, 2013). The literature also points to the fact that more academic research based on processes and contexts related to non-user groups in different social situations is needed in order to overcome the “knowledge gap” when it comes to emerging digital exclusion.

Following the literature review, this chapter provided an overview of ICT development and the status of the digital divide in Australia. Census data clearly shows that there have been continuing increases in access and use among Australians, as well as a growing demand for internet use in relation to social activities for different purposes, such as banking transactions, social networking and entertainment. However, data also reveals that a considerable number of Australians are left uninvolved in such online activities, at least to some extent, and that there are still a significant number of Australians who identify as non-users, which results in the rather slow growth of internet adoption in Australia. There is no doubt that Australians have become more and more connected. As society becomes more technologically integrated, those who are not ready to adapt to the digitalised social systems and services may experience more significant exclusion than before. However, the experiences of the excluded when it comes to technology and resulting digital exclusion and the circumstances underlying such persistent disengagement need further examination.

Chapter 3 Methodology

This chapter explains and justifies the research methodology and methods adopted in this study to achieve the research objectives. Two primary research methods are integrated based on a qualitative approach. The first is document analysis of published government policies and strategies related to broadband infrastructure and the digital divide in Australia. The second method involves in-depth interviews of non- and limited internet users using an inductive approach. The chapter begins with an outline of the overarching approach of the research before providing details of the specific methods used.

3.1. Methodological framework and approach

The major consideration when conducting the research was selecting a methodological approach that was adequate for answering the research questions, and yet resonated with the philosophical values of knowledge development within digital inclusion research. The literature review revealed that empirical and evidence-based research on digital exclusion is needed to provide new insights into policies and that there is a need for a new approach to understanding the sociocultural contexts of individuals and social groups who are digitally excluded, as well as the underlying reasons for their constant disengagement. Therefore, it was necessary to critically examine not only existing assumptions built into digital divide studies, but also the existing approaches that were used in collecting data and capturing and analysing the different circumstances of digital exclusion among individuals and social groups. By doing this, the limitations in understanding the compound effects of digital exclusion can be addressed and then can ultimately play a role in linking the grounded evidence to digital inclusion policy.

Although there is little doubt that qualitative inquiry is the appropriate approach when little is understood of phenomena as it can be used inductively to develop a theory (Creswell, 2013; Polit & Beck, 2012), further exploration of other types of research can assist in finding relevant theories from different disciplines that suit a study. This study used an inductive approach in its analysis. According to Thomas (2006), inductive analysis refers to “approaches that primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher” (p. 238). The fundamental principle of inductive analysis is consistent with grounded theory, which aims to generate emergent theories from the data (Charmaz, 2008; Strauss & Corbin, 1998).

In this regard, Braun and Clarke (2006) state that inductive analysis bears some similarity to grounded theory given that the themes identified in inductive analysis are strongly linked to the data it concerns. In terms of analysis techniques, an inductive analysis approach also shares similarities with grounded theory when it comes to its procedures of coding, and identifying categories and themes. As researchers undertake coding of the data, they develop appropriate codes to label classes/categories without trying to fit it into a pre-existing frame, or the researchers' analytic preconceptions (Braun & Clarke, 2006). Therefore, the inductive approach is often highly dependent on coding as a means of identifying themes in the data (Patton, 1990), and is appropriate for investigating a diversity and range of experiences (Braun & Clarke, 2006). The following section reviews the core principles of grounded theory and constructivist grounded theory, which has guided this study.

3.1.1. Grounded theory

Grounded theory originated with Glaser and Strauss (1967), whose foundational work examined the experience of the dying at hospital in the 1960s. Glaser and Strauss published a book, *The Discovery of Grounded Theory*, which has been described as challenging the notions of methodological consensus. Glaser and Strauss assume qualitative research to be an objective of social science because theory can be discovered "from data systematically obtained from social research" (Glaser & Strauss, 1967, p. 2). The fundamental intention of grounded theory is to provide systematic strategies for qualitative research in constructing "abstract theoretical explanations of social processes" (Charmaz, 2006, p. 5). Grounded theory expanded beyond health and nursing research over the years to become one of the most widely used methodologies for analysing qualitative data across a variety of social science disciplines (Bryman, 2015; Lawrence & Tar, 2013). As a result of its growing popularity, divergent approaches to practicing grounded theory evolved.

Grounded theory begins with inductive strategies for data collection and analysis in order to develop theories. Charmaz (2006) organises the components of GT practice, defined by Glaser and Strauss, in the following way (Charmaz, 2006, p. 5).

- Simultaneous involvement in data collection and analysis;
- Constructing analytic codes and categories from data, not from preconceived logically deduced hypotheses;
- Using the constant comparative method, which involves making comparisons during each stage of analysis;

- Advancing theory development during each set of data collection and analysis;
- Memo-writing to elaborate on categories, specify their properties, define relationships between categories, and identify gaps;
- Sampling aimed at theory construction, not population representativeness;
- Conducting a literature review after developing independent analysis.

Each process is entwined with every other process. Coding and analysis includes two stages: initial coding, and focused coding. These results guide the subsequent sampling of participants through theoretical samples. The themes, sub-categories and core categories result in dense, saturated core categories. The core categories are then sorted, written, theorised, and cross-referenced with the literature during the process of coding and analysis.

Charmaz views grounded theory methods as principles and practices rather than prescriptions for qualitative research, thereby emphasising flexibility in carrying out grounded theory research. However, it is recognised that novices and PhD researchers utilising grounded theory are faced with the challenge of navigating their way through divergent paths in practicing grounded theory (Breckenridge, Jones, Elliott & Nicol, 2012; Nagel, Burns, Tilley & Aubin, 2015). Glaser (2001) suggests that the selection of grounded theory methods should be based on the needs of the researcher. Researchers need to refer to useful exemplars of grounded theory studies in deciding which method suits their research context, as well as in understanding and preparing for the practicalities of carrying out their own grounded theory research (Breckenridge, Jones, Elliott & Nicol, 2012).

3.1.2. Constructivist Grounded Theory

The ultimate goal of any grounded theory approach is the emergence of theories from data (Charmaz, 2008). In terms of understanding and using the concept of emergence, there are different approaches to interpretations and perspectives including Charmaz's constructivist grounded theory. In the constructivist grounded theory approach, the methods for studying a phenomenon are regarded as flexible guidelines, and thus the studied phenomenon is crucial rather than the methods of studying it (Charmaz, 2014). This approach acknowledges that pure induction is impossible to achieve, which is emphasised in Glaser's approach, because the questions to be asked are from the "empirical world frame what we know of it" (Charmaz, 2005, p. 509). Grounded theory is to "understand research participants' social constructions" as well as for researchers to "construct throughout inquiry" (Charmaz, 2008, p.397). Therefore, Charmaz views a researcher as a part of the research process and product

and thus acknowledges the concepts emerged from the data are the researcher's interpretation.

Charmaz (2008) highlights the tenets of the grounded theory method that puts into practice grounded theory as follows (p.155):

- minimizing preconceived ideas about the research problem and the data;
- using simultaneous data collection and analysis to inform each other;
- remaining open to varied explanations and/or understandings of the data;
- focusing data analysis to construct theories

The ways in which constructivist grounded theory enables emergence involves two key properties: (1) systematic, active scrutiny of data and (2) the successive development and checking of categories (Charmaz, 2008, p. 161). Charmaz (2008) explains that, when scrutinising data, the researcher asks two key questions: "What is happening here?" and "What are these data a study of?" (p. 161). Both questions force the researcher to examine the empirical world and link it to theoretical possibilities in the data; this encourages researchers to follow emergent ideas and themes systematically. Systematic inductive analysis is used in grounded theory to make sense of the data. Systematic inductive analysis was used in this study to identify themes with the underlying reasons for non- and limited use of technology and digital exclusion. Second, grounded theory uses a process of concurrent data collection and analysis and, by doing so, "enables the emergence of new ideas, questions, and deeper refinement of earlier concepts" (Charmaz, 2008, p.162). The simultaneous involvement of data collection and analysis allowed refinement of the data collection process. Also, the constant comparative method (Charmaz, 2008; Glaser & Strauss, 1967) was used to compare themes and codes in the inductive data analysis, which yielded certain actions, experiences and issues, in an attempt to determine variations in the emerging concepts.

Charmaz advocates that a constructivist approach to grounded theory is both possible and desirable because "data do not provide a window on reality. Rather, the 'discovered' reality arises from the interactive process and its temporal, cultural, and structural contexts" (Charmaz, 2000, p. 524). For grounded theory researchers, Charmaz's work provides guidance in making meaning from the data, and rendering participants' experiences into readable theoretical interpretations.

Overall, both the philosophical underpinnings of Charmaz's approach to grounded theory, and the methodological processes it entails, fit with the goal of this thesis in terms of the emergence and objectivity of theory. Charmaz's constructivist approach provides the foundation for understanding the complex circumstances of digital exclusion by guiding the research to look closely at the everyday experiences of those who experience digital exclusion, including how these experiences are shaped by policy and how people actively make meaning. This approach reinforced my constructivist interpretation of the personal epistemology of non- and limited use and digital exclusion and, in turn, enabled this study to link the experiences of the digitally excluded to digital inclusion policy.

3.2. Policy analysis

The first goal of this study was to analyse the development and implementation of digital divide policies with the aim of achieving a better understanding of how the Australian government has perceived and defined the "digital divide" over time, and what the main considerations of digital divide policies are. By examining policies, I aimed to identify policy gaps that have resulted in a persistent digital divide in the hope of providing a better direction for digital inclusion in Australia.

3.2.1. Document analysis

Document analysis is a systematic procedure for reviewing or evaluating printed and electronic material in a variety of forms, such as books, brochures, diaries, journals, newspapers, organisational reports, survey data and policy documents. The analytic procedure entails finding, selecting, appraising, and synthesising data contained in documents (Bowen, 2009). The major emphasis of document analysis is to capture the meaning and themes of messages within texts. Altheide (1996) notes that "it is difficult to know the variety of all the data that needs to be collected for analysis at the start of the research and that the rationale for collecting data for analysis must emerge as the researcher inspects and reflects on some initial material" (p.33). He suggests that qualitative document analysis is more useful for capturing context, rather than "trapping" the analysis with too many preset categories and cases derived from a rigid quantitative plan. The idea is to select materials for conceptual or theoretically relevant reasons, particularly when analysing policy.

In this study, publicly available official documents on broadband infrastructure and digital divide policies were the focus. Since digital divide policy is a part of broader ICT policy, it is necessary to include policy documents related to overall ICT strategies (Kim, 2002). Reviewing the content of strategies, policies and programs of action produced by the Australian government allowed a glimpse into the ways in which ICT development and the digital divide have been problematised as an objective of government. In Australia, digital divide policies have been explicitly implemented since 1997, so official policy documents on broadband infrastructure and digital divide policies announced by Australian federal government departments and authorities from between 1997 and 2015 were mainly included in the analysis. In addition, *Networking Australia's Future*, which was released in 1994, was also considered in the review as this report contains active debate on the use of broadband and internet services and the further delivery of services in the early phase of broadband adoption (Agius, 2013) before extensive funding allocation for ICT development in 1997.

3.2.2. Data source

For this analysis, fourteen key documents issued by the Australian government [Table 3.1] that fell into two broad categories were examined. The first category comprised of seven formal policy documents that provided text on the policy context, objectives and strategies of major ICT development policies, such as *Networking the Nation* (NTN), the *Telecommunications Action Plan for Remote Indigenous Communities* (TAPRIC), the *National Broadband Strategy* (NBS), the National Broadband Network (NBN) and the *National Digital Economy Strategy* (NDES). The documents were published between 2004 and 2013 by government departments and authorities, such as the Australian Communication and Media Authority (ACMA), the Department of Communications, Information Technology and the Arts (DCITA)/Department of Broadband, Communications and the Digital Economy (DBCDE) (at present the Department of Communications and the Arts (DCA)), and the National Office for the Information Economy (NOIE) (at present the Australian Government Information Management Office (AGIMO)). The second category comprised of eight external review and analysis reports that provided information on the outcomes and impacts of policies, initiatives and policy recommendations according to analysis findings. These reports have played a crucial role in laying the foundation for subsequent initiatives and strategies over the last decade.

Table 3.1 Documents used in the analysis

Year	Report	Type	Department
1994	Networking Australia's Future: The Final Report of the Broadband Services Expert Group	External review	Australian Government
1999	Networking the Nation Board Audit Report: The Regional Telecommunications Infrastructure Fund	Audit report	Australian Government
2000	Connecting Australia : Telecommunications Service Inquiry	External review	DCITA
2002	Telecommunications Action Plan for Remote Indigenous Communities (TAPRIC)	Policy	DCITA
2002	Connecting Regional Australia: Regional Telecommunications Inquiry	External review	DCITA
2003	Australia's Broadband Connectivity: Broadband Advisory Group	External review	NOIE
2004	Australia's National Broadband Strategy.	Policy	DCITA
2004	Networking the Nation	Policy	DCITA
2005	Networking the Nation: Lessons Learnt	Analysis	DCITA
2006	National broadband strategy implementation group: key performance indicator report	Analysis	DCITA
2006	Broadband Blueprint	Policy	DCITA
2008	Regional Telecommunications Independent Review Committee Report: Framework for the Future.	External review	Australian Government
2008	Telecommunications action plan for remote indigenous communities	Policy	ACMA
2009	Australia's digital economy: future direction	Policy	DBCDE
2011	#au20 National Digital Economy Strategy	Policy	DBCDE
2012	Regional Telecommunications Review: Regional Communications: Empowering Digital Communities	External review	DBCDE
2013	Advancing Australia as a digital economy	Policy	DBCDE

Along with these key documents, annual and audit reports of the Department of Communications⁴ were reviewed in this study, including annual reports from between 2001 and 2014 and the Networking the Nation Audit Report (1998-99). These reports provide information on funded initiatives, budgets and outcomes of policy implementation, which

⁴ The communication department (currently the Department of Communications and the Arts, 2015~) has been changed during the period as follows:

In 2000-01, Department of Communications, Information Technology and the Arts (DCITA)

In 2002-12, Department of Broadband, Communications and the Digital Economy (DBCDE)

In 2013-15, Department of Communications (DC)

allowed for an exploration of the major policies in terms of resource allocation and, in turn, identification of the main considerations of the policies.

All documents were collected online, except *Networking Australia's Future* (1994) and *Connecting Australia* (2000), which were obtained in hard-copy from the National Library of Australia.

3.2.3. Data analysis

The document analysis process used in this study consisted of reviewing and organising the documents based on an analytical policy framework and categories. Specifically, in the key ICT policies, relevant projects were organised into several categories such as: targets and sectors of policies, specific and detailed plans (beneficiaries and programs), and resource allocation (budget). These were expected to provide an idea of what have been the main considerations of digital divide policies in Australia (Hilbert, 2011). This information was mainly drawn from the first category of documents, including the seven formal policy documents in which the policy goals, main strategies, beneficiaries, fields, relevant projects and expected outcomes are articulated in statements. Documents in the second category provide policy recommendations based on the findings of policy outcomes and impacts analysis, so were reviewed in order to understand the main considerations and context of funding allocations in the policies. Information on specific initiatives and budgets drawn from annual and audit reports was also used as evidence for the extent to which resources were allocated to projects and initiatives, and for how long.

Along with organising the key policies based on their components, I categorised the initiatives and projects implemented under the major policies based on a framework of policy tools – supply-side and demand side – to stimulate broadband penetration (Belloc et al., 2012; Kim, et al., 2010). Demand side policies are the efforts to boost the use of broadband by raising awareness of its possible benefits, as well as making it affordable and more attractive to potential users, while the supply-side policies related to the push for broadband deployment, coverage and availability via the provision of resources that support operators and the construction of broadband infrastructure. Previous research (Belloc et al., 2012; Kim, et al., 2010) includes details of supply- and demand-side policies, and these were used to categorise the sub-initiatives and programs in this study in order to examine the main considerations of the Australian government's digital divide policy. The process aimed to suggest how the

government perceives and defines the digital divide in policy making. If it turns out that most resources are spent on infrastructure development and focusing on the supply-side, it could be concluded that policy makers understand the digital divide in terms of access to ICT. Such identification of the continued role of ICT policy can lead to a better understanding of the nature of existing perspectives and practices.

Both the reviewing of policy-related statements and organising initiatives and projects constituted the reiteration process of document analysis in this study. The key policies are described and examined in the following chapter in chronological order.

3.3. Interviews

In the second phase of this study, an in-depth interview method was employed to collect data. Intensive qualitative interviewing is particularly regarded as the best fit in a grounded theory study because it allows for intensive exploration of the area in which the interviewee has substantial experience. By conducting in-depth interview with non- and limited users, I aimed to collect as many diverse exclusion experiences and underlying reasons for disengagement online, looking closely at the reality of many different situations relating to individuals and social groups.

3.3.1. Data collection

3.3.1.1. Rationale for Canberra as the research site

I chose to examine digital exclusion by investigating the underlying issues of those excluded from internet connection in Canberra, Australia's national capital. The estimated resident population of Canberra was 385,996 in 2014-15 ABS. Canberra is a unique city compared to other cities in Australia with higher levels of social indicators than other places, in such as education, income and employment. About 20.1% of the ACT population is employed in Central Government Administration which requires high minimum education standards (ABS, 2011). According to the ABS 2011, 24.7% of residents have a bachelors or higher degree, well above the 14.3% national average. The median weekly income of households in Canberra is \$1,920, while the national average is \$1,234. The percent of the full-time employed is 65.0%, above the 59.7% national average.

Along with relatively higher standard of living, Canberra is one of the most connected areas in Australia. According to the ABS, 85.9% of Australians have access to the internet at home, but 94.1% of households had internet access at home in Canberra in 2014-15. Canberra also has a higher uptake of high speed broadband, with 75.9% of households having access to a broadband connection, as compared to an average of 67.1% of Australian households (ABS, 2011). In terms of the household desktop/laptop computer ownership to access to the internet, 96.8% of households in Canberra report owning desktop/laptop computer, while the Australian average is 93.6%. Furthermore, Canberra has a strong digital foundation compared to other territories. For example, Canberra was the first state to introduce an electronic voting system (e-voting). This system was first used in the 2001 ACT Legislative Assembly election and has been used at subsequent elections in 2004, 2008, 2012 and 2016.

Canberra has been marketed as a leading digital city by the government. The government ICT strategy, Digital Canberra Action Plan 2014-2018, is a roadmap toward becoming a smart city with a digital economy, a connected community, open government and digital services (ACT Government, 2014). Digital opportunities for all members of the community are identified in the plan, such as the improvement of resident and visitor experiences, the provision of mobile access and services, and the enhancement of the innovative culture of Canberra.

The composition of this highly wired environment is such that it still has pockets of digital exclusion, meaning Canberra is a suitable location to investigate how people who live in wired communities experience digital exclusion in order to ascertain the underlying reasons why some lack either knowledge or access to be digitally enabled. These issues can be intertwined with exclusion in a well-connected and marketed leading digital city. These new types of digital exclusion have not been sufficiently explored and Canberra provides an opportunity to discover new pockets of digital exclusion in a highly wired society.

A grounded theory approach seeks, not only to develop pertinent concepts and their associations, but also to demonstrate actions, roles and interactions as reactions and adaptations to particular situations (Bryant & Charmaz, 2007). This enables developed understanding of the phenomena in question. Therefore, in undertaking this research it was crucial to be aware of the surrounding circumstances of the research location that result in a relatively higher digital adoption rate, as doing so assists in understanding the experiences of the digitally excluded.

3.3.1.2. Participant selection

Studying non-use poses certain methodological challenges, particularly in sampling methods and recruitment (Baumer et al., 2015). Qualitative inquiry methods are flexible and permit the researcher to discard unproductive strategies and adopt new ways of sampling (Bryant & Charmaz, 2007). The effective and efficient gathering of adequate and appropriate data is regarded as the key to developing theory in a ground approach (Bryant & Charmaz, 2007). Therefore, it is possible to be flexible in forming strategic sampling methods that can be altered depending on the development of the research. In particular, when it comes to the initial approach in selecting participants, accessibility is a crucial consideration for any researcher. If the phenomenon is difficult to identify (that is, it is difficult to find participants who are willing to talk about their experience), recruitment can be challenging throughout the entire course of the research. Therefore, the most obvious way to locate participants is to find them where they are; that is, to recruit intentionally (purposefully) using a practical approach from the very beginning (Bouma & Ling, 2004; Berg, 2007; Bryant & Charmaz, 2007).

In the beginning, it was necessary to identify the scope and trajectory of the overall process. Accordingly, a purposive sampling method was employed to identify a broad range of non-users. This did not merely consider those without access from a dichotomous perspective but also those labelled for example, dropouts, narrow frequent users, net evaders and novice users in different ways that were contingent on different situations and usage as observed in the literature.

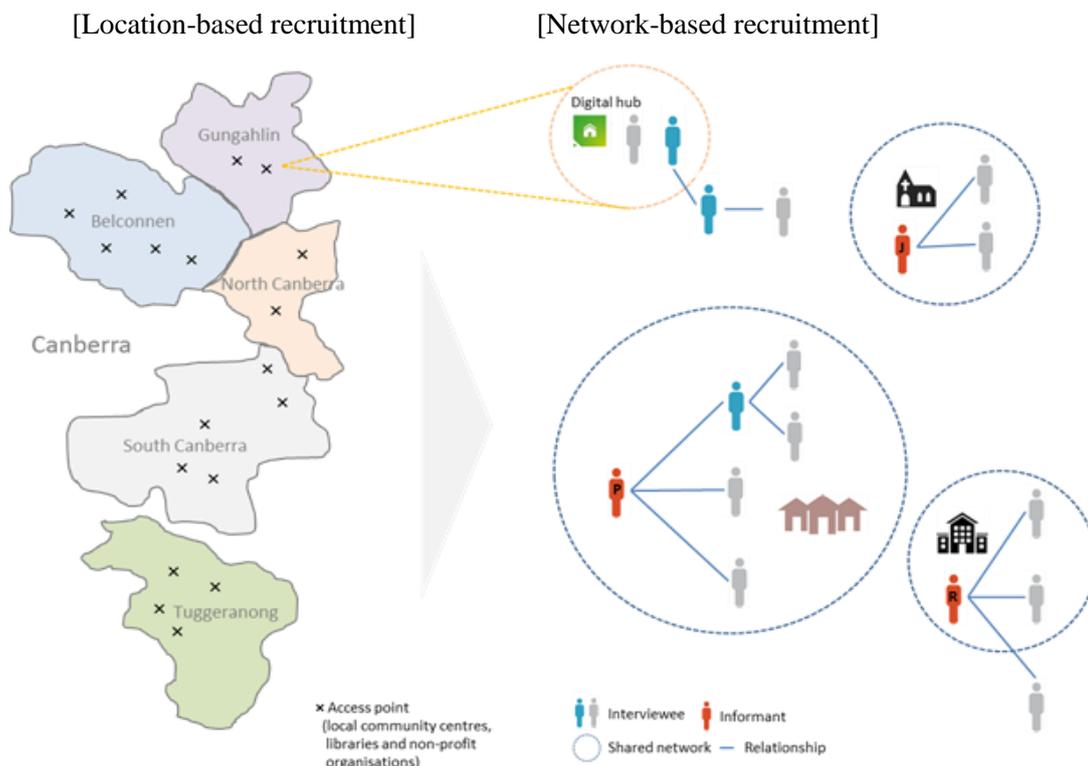
In this study, I recruited participants based on the following criteria: those who did not have home internet access; those who did not use the internet or a computer; those who used the internet or computer infrequently or in a limited way of usage (e.g. online activities); or those who used the internet only through smartphones or tablets. Purposive sampling is one technique often employed in qualitative investigation, in which the certain aspects of individuals are used as the basis of selection (Wilmot, 2009). In this study, instead of recruiting participants based on socio-demographics alone, I focused on the context of non- and limited use, which allowed the collection of targeted information for the study.

3.3.1.3. Recruiting participants: a mixed methods approach to improving recruitment

In this study, participants were recruited using several methods. Initial recruitment took place by using flyers and seeking assistance from staff members of community centres and local libraries. Subsequently, a snowballing method was employed as an indirect recruitment strategy with the help of key informants. A few participants were recruited through a Digital Training Centre.

Initial outbound recruitment was attempted based on the location of several local public centres, local libraries and non-profit organisations, as shown in Figure 3.1. After experiencing difficulties in this approach, an alternative strategy for recruitment, network-based recruitment through several informants, was adopted to reach participants. In the course of recruitment, informants played key roles in connecting the researcher to potential participants. Moreover, some of the initial interviewees also assisting in finding additional participants to whom they were close, such as partners or neighbours. Snowball sampling has a number of advantages for sampling hard-to-reach social groups, such as the deprived and the socially stigmatised (Atkinson & Flint, 2001; Heckathorn, 2011). The use of snowball strategies in this study provided a means of accessing the “non-user” group, which is a somewhat hard-to-reach group due to its small population and underlying stigmatisation.

Figure 3.1 Recruitment methods adopted



As data collection progressed, the recruitment procedures were expanded to include those who were involved in professional areas, such as medicine, education, business and management, in order to learn more about the experiences of those who work with new information and communication technologies.

My initial sampling strategy facilitated comparative analysis by giving me access to contextually different individual circumstances beyond personal characteristics. I focused on the different contexts which yield certain actions, experiences and issues in an attempt to determine variations in new concepts that emerged from the initial analysis. My decision to recruit additional interviewees at this point was made after the first round of data collection and coding. The iterative process of comparison was continued and then, when the ideas of new concepts came up, I started seeking follow-up data which I felt would be helpful in uncovering variations to refine the concept. What intrigued me from the previous course of data collection and initial coding was that, although the majority of interviewees were economically inactive, such as retirees or housewives, they felt some pressure to use/start using the internet and even improve their abilities or skills related to the internet and digital devices. Bearing this in mind, I sought follow-up interviewees to learn more about the experience of those who work with new information and communication technologies. I assumed that higher expectations in terms of digital technology use would be pervasive in working environments. Consequently, I believed that exploring such circumstances might offer a variation to the concepts developed in the previous analysis.

Follow-up data were collected until repeated examples lead to saturation or redundancy, as salient issues, themes, and examples began to be repeated rather than extended (Morse, 1995). At this point, I stopped recruiting participants and no further interviews were conducted.

Stage one: analogue advertisements

In the initial stage (1 August to 30 October 2014), I contacted seven local community centres, six libraries and five non-profit organisations, such as senior centres and local churches across Canberra. Contact was made by visiting in person, handing over information sheets and flyers about the research project, and sending emails through public contact points provided on websites. Furthermore, I obtained information about unpaid coaching programs for job seekers through the bulletin boards of local communities, and then requested staff forward research flyers to the participants of the coaching sessions. However, the initial

recruitment strategy did not work effectively, yielding only two participants. Most staff members that were contacted initially, such as receptionists, were willing to make some time for me to explain the research and put flyers on their bulletin boards, but it proved difficult to gain further advice or support. Some rejected the request or expressed a clear lack of enthusiasm, while others introduced the researcher to other staff members who could be utilised as informants.

Additionally, there was an underlying challenge that not using or having internet or computer access may be a sensitive issue for some people. There are various situations and contexts, such as the existence of financial pressure or a lack of literacy skills, which result in non-users being excluded digitally. This can make it more difficult to find interviewees willing to speak about their experiences.

From this method, two participants were interviewed in October 2014.

Stage two: sampling based on personal networks

Alternative strategies for recruiting participants were employed by capitalising on initial informants who were able to reach additional interviewees. The informants did not participate in this study as interviewees but, instead, were actively engaged in recruiting interview participants. I also utilised my own networks to recruit interviewees, rather than rely on outbound recruitment, such as flyers.

This approach is similar to a snowballing or nominated sampling method, in which the researcher requests introductions from the initial participants in order to invite their friends and acquaintances to participate in the study (Bryant & Charmaz, 2007). However, in this study, informants who invited their acquaintances that met the research participant criteria were substituted for the initial participants who generally played a key role in connecting the researcher with potential participants in a snowballing method. The informants in this study were social intermediaries who had diverse networks, such as school parent networks, and townhouse resident networks.

The reasons for approaching recruitment this way were twofold. First, as mentioned above, sensitivity among those who do not use or do not have access to the internet appeared to influence potential participants, making them reluctant to introduce acquaintances from their social networks who are non- or infrequent users. Second, as a result, an indirect strategy of recruitment via informants seemed to work effectively in this study because it allowed me to

access the informants' social networks. This worked better than recruiting via initial participants who would be expected to invite the next participants in a general snowballing method. The intimacy between the informants and the members of his/her networks enabled me to access and establish a rapport with the members who would be potential participants.

Three informants played key roles in the second stage of recruitment of the study. The first informant was Rebecca⁵, a parent who belonged to a school parent network at her children's primary school. The second informant was Peter, a lecturer at a university who lived in a townhouse in which all residents were mature single individuals. The third informant was John, a deacon in a church. The initial participants were mainly recruited through these informants. The first informant connected me with potential interviewees utilising her school parent network. Only school parents who were willing to participate in the study were contacted by me. I tried contacting them both by phone calls and face-to-face, before explaining the study to them and handing over information sheets. Thereafter, I recontacted them and arranged a time for interviews. The second informant arranged a community activity for residents of the townhouse in which he lives and introduced me to the residents. I had an opportunity to build rapport with potential interviewees during the activity. Following this, another activity to promote friendly relations with a few of the residents was arranged by the second informant. I arranged interview schedules with those who were interested in the study. The third informant introduced me directly to several church members who were willing to participate in this study. Existing trust in the informants helped greatly in initially contacting potential participants.

It was necessary to allow time to create rapport with potential interviewees. Throughout the recruitment process, I kept in touch with potential interviewees, contacting each of them twice so that they would have a period of time to make an informed and unpressured decision about their participation, and in order to establish rapport. This also facilitated referrals of others from within their social network (Glaser & Strauss, 1967).

Eight participants were recruited at this stage and interviewed from November in 2014 to February in 2015.

⁵ Names have been change to protect participants' privacy, considering the sensitivity about involvement.

Onsite recruitment: digital training centre

I also recruited participants through the ACT Digital Hub, which is an IT learning centre for local people. I had been doing volunteer work as an assistant in computer training sessions at the Digital Training Centre and observed that the visitors were very diverse in their level of skill, from novices to skilled users, and in their digital devices, from laptops, to smartphones, to tablets. The functions or programs which the visitors wanted to learn were also varied.

I recruited further participants for the study following one-on-one training sessions at the Digital Training Centre. I asked if visitors would like to be part of the study, and those who gave positive responses were then provided with an information sheet explaining the study. I asked the potential participants about their decision to participate when they next visited the training centre, emphasising that participation in this study was entirely voluntary. Upon agreement, the researcher arranged interviews before or after subsequent training sessions.

Four participants were recruited at this stage and interviewed from December in 2014 to March in 2015.

3.3.1.4. Participants' characteristics

A total of 14 participants were recruited and interviewed based on the aforementioned recruitment procedure. Table 1 shows the characteristics of the participants. Participants ranged in age from their 30s to 80s, and were mainly females and retirees. Seven were mature single individuals; three were from mature couples, three were from young families with young children, one was from a mature family living with adolescent children.

When it came to internet access, ten participants had home internet access. Of these, three used mobile internet access, such as 3G/4G data or a 4G USB dongle (mobile broadband), three participants did not have internet access at home, and one participant, who lived in a retirement village, had public internet access. In terms of digital device ownership, all participants but three had a PC (laptop or desktop) at home and one participant had a public desktop available in the public space of the retirement village. There were eight participants with multiple devices at home.

Five participants were non-users. Of these, two participants had never used the internet and one was a lapsed user who had been an active user for a certain period of time. Nine participants used the internet; however, there were individual variations in usage among

users. Two participants reported using the internet daily, while one used the internet 3-5 days a week. One participant used the internet on a weekly basis (1-2 days a week) and two every few weeks. There were three participants who used the internet several times a day; all of these were rather skilled users [Table 3.2].

Table 3.2 Participants' characteristics of the first round of interviews

Pseudonyms	Age	Gender	Route	Employment	Household	Use	Home access	Home devices
Jenny	30s	F	Informant J	part time	Young family	Several times a day	Y	Laptop/iPad
Layla	30s	F	Informant R	Housewife	Young family	Several times a day	Mobile internet(3G)	laptop/iPad
Rachel	40s	F	Informant R	Housewife	Young family	Non-use	Y	Desktop/iPad
Louise	50s	F	Digital Hub	part time	Mature family	3-5 days a week	Y	Desktop/laptop
Samuel	60s	M	Informant J	Retired	Mature couple	Every few weeks	Y	Desktop/laptop
Amanda	60s	F	Informant R	Retired	(Retirement accommodation)	Non-use	(Public)	(Public desktop)
Anna	60s	F	Parker	Retired	Mature couple	1-2 days a week	Y	Desktop/laptop
Parker	60s	M	Louise	Retired	Mature family	About once a day	Mobile internet(4G)	Laptop
Jane	70s	F	Scarlet	Never been employed	Mature family	Non-use	N	-
Catherine	70s	F	Scarlet	Retired	Mature family	Non-use	N	-
Clara	70s	F	Informant P	Retired	Mature family	Several times a day	Y	Laptop/Tablet/Smart TV
Emily	70s	F	Informant P	Never been employed	Mature family	Every few weeks	Y	Desktop
Scarlet	80s	F	Informant P	Retired	Mature family	Non-use	N	-
Jackson	80s	M	Digital Hub	Retired	Mature couple	About once a day	Mobile internet(3G)	Desktop/laptop

Follow-up interview participants' characteristics

I purposively recruited people who were involved in professional areas, such as medicine, education, business and management. A strategic and specific approach to collecting targeted data for the study was highly necessary and a willingness to speak to me about their own experience of ICT use and surrounding circumstances exercised considerable weight in recruiting the target interviewees. In order to facilitate recruitment, I relied on my own

networks, including acquaintances and colleagues whose widely dispersed networks yielded another seven interviewees.

The total of seven participants included a nurse, a teacher, a university lecturer, a self-employed individual, a secretary of a religious community, an administrative staff member, and an operations manager [Table 3.3]. Participants were aged in their 40s to 60s, four were male and three were female. One of participants worked as an operations manager of a regional conference centre and resided near the centre in a regional community. All of them used the internet and computers both for work and personal purposes, except one participant who seldom used the internet and computers for personal purposes. All of the seven participants had internet access and a personal computer (desktop or laptop) at home.

Table 3.3 Participants’ characteristics of the follow-up interviews

Pseudonyms	Age	Gender	Employment	Family type	Internet use for		Home access	Home computer/devices
					work	personal		
John	60s	M	college lecture	Mature single family	Y	Y	Y	Desktop/laptop
Lily	60s	F	administrative staff	Mature family	Y	N	Y	Desktop/laptop
Helena	50s	F	nurse	Mature family	Y	Y	Y	Laptop/iPad
William	50s	M	secretary of religious community	Mature Single family	Y	Y	Y	Desktop
Jenny	50s	F	teacher	Mature Single family	Y	Y	Y	Laptop
Jonathan	50s	M	Self-employed	Mature Single family	Y	Y	Y	Laptop
Peter	40s	M	Operations Manager	Young family	Y	Y	Y	Desktop/laptop

3.3.1.5. The in-depth interview process

This study employed an open-ended, in-depth interview method to collect data. Charmaz (2014) suggests intensive qualitative interviewing, particularly an open-ended, in-depth interview method, because it allows for intensive exploration of the area in which the interviewee has substantial experience. It does so by providing “the interactive space and time to enable the research participants’ view and insights to emerge” (Charmaz, 2014, p.85).

There have been attempts to better determine the underlying circumstances of non-users; for example, Selwyn, Gorard and Furlong (2005) suggest a ‘life-story’ method in which internet

non-users are interviewed about their experiences, thereby creating an autobiography of technology use and non-use. I adopted their approach when beginning interviews with participants in this study, specifically by asking about participants' daily routines. This approach also allowed me to build rapport with participants, thereby lessening any possible tension that might have resulted from an imbalance between the interviewer and the participants who were talking about their personal lives, which are closely associated with the circumstances of their non- or limited use. In this regard, it is worth noting Gubrium and Koro-Ljungberg's argument that "sharing control" over the conversation with participants allows "co-construction of knowledge" during the interview (2005, p.739).

Participants provided substantial accounts of their routine activities, social lives and media consumption, which naturally led to an explanation of their internet use, unless in the case of a non-user. It is notable that there is a distinct difference in the everyday activities of non-users and users. For users interviewed in this study, it was observed that online activities were included as part of a daily or weekly routine.

The initial interview protocol was modified as the data collection proceeded in order to reflect questions emerging from early interviews (see Appendix 4). In particular, as individual history of non-use and use experiences were crucial to better understanding interviewees' circumstances, it was necessary to be flexible when asking questions by preparing separate questions for each individual context.

For example, questions that were asked user interviewees about their (prior) experiences of internet use included:

- How often do you use the internet?
- What do you mainly use your computer for?
- How long ago was it that you started using the internet?
- How did you come to use the internet?
- Do you think you do not use the internet as often as before or has your usage increased?

For those who used to use the internet but did not anymore, the following questions were added.

- How long ago was it that you stopped using the internet?

- Are there any reasons that you stopped using it?

For those who started using the internet recently, the following questions were added.

- Could you tell me why you started using the internet recently?
- Were there any reasons for non-use of the internet before?

Furthermore, it was important to take different social contexts into account in the interview protocol, such as that of school parents, in order to understand the experiences of non- and limited users. The third interviewee, a full-time mother of four children, inspired additional questions relating to education and technology, given a range of changes surrounding ICTs in schools, such as in terms of learning, enrolment, communication with teachers and parent communities. Based on such information on changes in schools today, I proceeded to ask other school parents related questions, thereby contributing to an understanding of the emerging theme of digital exclusion.

Interviews were arranged according to the participants' comfort and convenience. Participants chose the date, time, and location of interviews. Interviews were mainly conducted in participants' houses, which also facilitated opportunities to observe their internet connections and devices and the settings in which internet and computer use take place, thereby contributing to a better understanding of the various contexts surrounding individuals. The interviews took place over two years between August 2014 and August 2016, a period which included recruitment. Each interview took approximately one to two hours, excluding the initial paperwork. One interview proceeded in two parts.

Part of the informed consent process included giving a thorough explanation of the study and informing participants of their rights to withdraw from the interview at any time. All participants were then asked to sign a consent form. The interviews were recorded and the data was backed up onto my locked desktop and cloud storage. The recordings were transcribed as soon as each interview was completed.

Fieldwork journal

I wrote notes after each interview rather than make them during the interviews because it was very important for me to have open-minded conversations so that the interviewees did not feel uncomfortable recounting their experiences of technology in their communities, or expressing their feelings and thoughts. Therefore, I wanted to minimise any activities that

would indicate a formal interview, such as note-taking. Furthermore, actively listening to interviewees' accounts was also vital so that I could react immediately to their intriguing experiences/thoughts with follow-up questions, which allowed for further exploration of unanticipated issues identified by the interviewees.

The notes were developed in the form of a research journal that included my reflections on the formal interviews and observations of the interviewees' reactions and expressions at certain points during the interviews. Also, I wrote my understanding of each interviewee's circumstances of extended non- and limited engagement online, linking their personal circumstances to such situations. With the interviewees' agreement, several photos were taken during conversations that showed how interviewees used digital devices, such as laptops and tablet PCs. I inserted such photos in the journal describing interviewees' accounts and my observations. Writing the research journal allowed for continued engagement with the data collected and thus led me to better understand the linkage between the themes and concepts that emerged from the data.

3.3.2. Data analysis

Thematic analysis, which has been seen as a foundation to qualitative analysis, was adopted as the analytic method in the examination of the interview data for this study. Thematic analysis has emerged as a common method in qualitative research. Grounded theory often entails the search for themes, and so researchers employ the basic methods of qualitative data analysis, many of which were developed in the context of grounded theory (Bryman, 2015). The decision to use thematic analysis here was based on two considerations. First, social interactions and processes underpin the phenomenon I sought to understand in my study on non- and limited users. Since grounded theory is recognised as a methodology that can achieve an understanding of underlying social processes associated with a phenomenon (Charmaz, 2014; Glaser & Strauss, 1967), this approach best fit my research. The second assumption was that it was important to collect as many as possible diverse exclusion experiences and underlying reasons for disengagement online in digital exclusion studies, looking closely at the "facts" of many different situations relating to individuals and social groups (Glaser, 2011, p. 243). In this way, I could fill the literature gap defined by an absence in digitally excluded voices. Conceptualising would consequently be grounded on emerging concepts from the data.

To code and make sense of the data, two main phases of coding process were used, both drawn from grounded theory - an initial coding phase and a focused, selective coding phase (Charmaz, 2014). Charmaz (2014) defines initial coding as an attempt to look at what is happening and “see actions in each segment of data rather than applying pre-existing categories to the data” (p. 116). After initial coding, researchers move to a focused, selective coding by identifying the most significant or frequent codes created through line-by-line coding, and, in this way, can sort, synthesise, integrate and organise a large amount of data (Charmaz, 2014).

While engaged in initial coding, you mine early data for analytic ideas to pursue in further data collection and analysis. Initial coding entails a close reading of the data..... During initial coding, the goal is to remain open to all possible theoretical directions indicated by your readings of the data. Later, you use focused coding to pinpoint and develop the most salient codes and then put them to the test with large batches of data. (Charmaz, 2014, p.114)

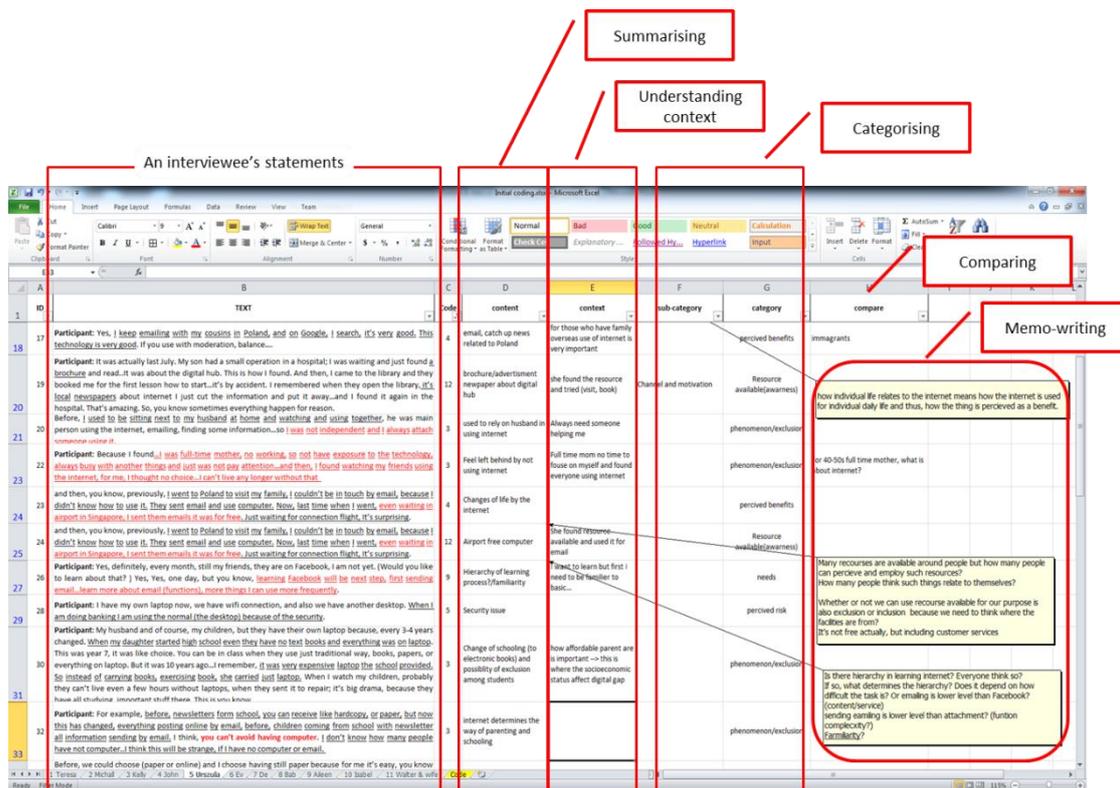
Throughout the process, the constant comparative method (Glaser & Strauss, 1967) was used to ensure consistency of themes and codes.

3.3.2.1. Initial coding

In order to conduct the initial coding in this study, each interview was transcribed into a Microsoft Word document. Following transcription, each interview was read while listening to a playback of the interview to check for accuracy, which also allowed me to become more familiar with the data. Then, all interview data was transferred to an Excel file where line-by-line coding was conducted as an initial coding process. I found Excel useful as an analysis tool, especially in conducting line-by-line coding, as it facilitated data handling using several functions, such as filtering, sorting and adding comments, which was used for writing memos.

As shown in Figure 3.2, each line in the Excel spreadsheet included the number of line, quote, code, content, context, category, sub-category and comparison. In total, a maximum of eight columns were created to analyse each quote. Along with the eight columns, the comments function of Excel was used to write memos during the course of initial coding. I wrote down my thoughts about the relationships between codes, as well as other theoretical ideas that came to mind, during the coding. Additional questions for subsequent interviews also emerged throughout this process, such as “how supportive are family members or others around non-users?”.

Figure 3.2 An example of initial coding in Excel



*A detailed example of initial coding is provided in Appendix 6.

Each quote was coded in the first two columns, content and context, to identify “what is happening”. The content column was descriptive coding, and the main coding column for the first time of the initial coding. However, during the coding for the first interview, I found it necessary to add further contextual information surrounding each incident, which was intertwined with another. Therefore, along with descriptive coding of incidents, I gave an additional designation to the initial codes as a means of representing the context involved in the content (responses). Relevant information surrounding the context that had been observed and reported during the interview was added to the context columns, which indeed helped me gain “a sense of what is happening in this statement and how it happens” (Charmaz, 2008, p. 164).

Below is an example of coding content and context. The excerpt is taken from Rachel, a non-user interviewee, in her 40s and a full-time mum, in response to my question about challenges to her starting to learn the internet and computer. The reported reason for her hesitation to start learning is summarised in the content column. Contextual information relating to there being only one desktop at home that her husband mainly uses is added to the

next column. Following further interviews, “limited ownership/sharing devices” was developed as a main theme of latent circumstances surrounding non-use.

N	quote	content	context
99	Also, because my husband hasn't got a job at the moment, [he] uses the internet [a lot]. When I see his computer has got a virus or something, it's sort of disappointing and I think to myself, if I was to get on there, I would probably put a virus on the computer. Every time he fixes it, it takes long hours to fix it, I am scared of disconnecting him.	Observing husband taking a long time to solve issues with computer viruses Being scared of disconnecting him by doing something wrong herself	Only one desktop available at home Husband is the main user and uses the internet on her behalf Never before used the desktop herself

Rachel’s initial explanation of her reason for non-use was “unfamiliarity with technology” as she grew up in very different learning environment from today’s where ICTs are integrated in many ways. This initially led me to consider such a reason as being the cause of her continued non-engagement online. However, when I conducted the initial coding shortly after the interview, I started seeing the underlying reasons implied by her responses to other questions in our conversation. Related causes of her non-use were reported in the context columns. Like Rachel, many non-user interviewees gave obscure explanations of their reasons for non-use of the internet and computer at first; however, through the coding process, my understanding of their underlying reasons for non-use was developed. In Rachel’s case, I found that it was limited ownership in the household as a result of sharing devices with skilled family members.

Followed by coding content and context, each quote was then categorised in several adjacent columns, such as category and sub-category. In this study, a category means a topic, such as “being excluded”, and, if necessary, was further categorised into a sub-category. In the initial stage of coding, I used somewhat broader categories, such as “reasons for non-use” and “being excluded”. This was due to there being observed difficulties in coding contextual data, as participants’ responses (experiences) were somewhat interrelated. Sub-categorising was also used to efficiently compare incidents with different situations/conditions within the broader context.

I also gave an additional designation to the initial codes to provide further information, and so enabled comparison within and between the different contextual settings of interviewees. The comparison column was used for this. Here are some examples of the content involved in the comparison columns: “comparing the different lifestyles of non-users and users”, “family

assistance between those who live alone and have family around them” and “lapsed users vs. non-users”.

Following initial coding, 680 codes from the first round of interview were assigned and placed in a codebook, generating 29 categories in total (see Appendix 6): these were then collapsed into a smaller number of categories during the course of focused coding.

3.3.2.2. Focused coding

In the second stage of the coding process, I carried out focused coding. The focused coding was designed to develop themes/concepts that were grounded in the data and ensure the development of codes that more accurately captured what was happening in the data. In order to do this, constant comparison was useful, as it enables researchers to see the similarities and differences between codes and, thus, form an overarching theme (Braun & Clarke, 2006). This course of coding is iterative, allowing researchers to move from data to code and then back to data. The codes and categories emanating from the interviewees’ statements involved interrelated concepts, in particular as they moved from the code to category to theme (Maloney, 2014).

First, I selected each coded category using the Excel filtering function, before re-reading all the interview data that had been coded. Second, I compared the existing categories by re-examining the data coded into content and context columns. Following this, some existing categories were merged into themes based on the similarity of their context. For example, the categories “reasons for non-use”, “perceived risk” and “perceived barriers” were merged into “underlying circumstances of non-use”. This linking of one category to another ultimately enabled me to see some latent circumstances behind non- and limited use of the internet.

Through this iterative re-examination of codes and categories most of the initial categories were coalesced into several themes, such as “underlying circumstances of non- and limited use”, “experiences of exclusion in everyday life” and “digital exclusion and relative deprivation”, which were then developed as core themes. The quantitative results of initial coding, in which the number of codes in each category was counted, confirmed the prominence of the three categories in the data, which accounted for two thirds of the 680 codes. Undoubtedly, these categories were related to the research questions.

Upon gaining a clear sense of the core themes, I began to develop a storyline in which the themes were described and connected. This process involved choosing, chronicling, and ordering findings to produce an account of the data. Birks, Mills, Francis and Chapman (2009) note that it is important to explain every individual case specifically when forming participants' stories. I found doing so particularly useful in developing a storyline for the theme of "underlying circumstances of non- and limited use" each interviewee had multifaceted reasons for their non- and limited engagement online. Bearing in mind the importance of variation, I paid equal attention to each condition, under which each interviewee had either no or limited opportunity to make use of the internet, regardless of its prominence within the theme.

The entire process enabled me to develop more conceptual underpinnings and connections between themes. Eventually, four categories were developed as core themes, which brought about a conclusion that was faithful to the perspective of the digitally excluded: reasons for non-/limited use, exclusion in everyday lives, digital exclusion and relative deprivation, and social encouragement and support.

3.4. Limitations of data collection and ethical considerations

3.4.1. Limitations of data collection

Data collection strategies were selected with the aim of yielding a rich data set to answer the study's research questions. However, there are limitations to the data collection strategies employed in this study, particularly in terms of the sampling strategy.

Participants were recruited participants mainly through snowball sampling, which heavily relied on the informants' social networks, such as parent groups, townhouse networks and church groups. Therefore, it is likely that this method narrowed the field of examination to people in specific social contexts. When it comes to snowball sampling strategies, bias might emerge as a result of sampling within networks that have relatively homogenous social traits, and therefore ignore "isolates" who are outside the networks (Atkinson & Flint, 2001; Griffiths, Gossop, Powis & Strang, 1993). This study did reveal in fact certain similarities among some participants, such as retirees and single elderly individuals. In order to minimise oversampling of a particular network of peers, exponential discriminative snowball sampling (Etikan, Alkassim & Abubakar, 2016) was used, so that by not asking every recruited participant to recruit another participant, the chain was discriminating. In this study, for

example, Peter, my second informant, recruited participants from his townhouse network, which was mostly made up of non- and limited users of the internet; however, the number of people recruited from this network was deliberately limited to minimise oversampling from one townhouse. Nevertheless, it is acknowledged that potential bias may have resulted from the network-based recruitment and isolation of people who do not belong to the networks tapped into.

3.4.2. Ethical Considerations

Ethics approval to conduct my research was granted by the Human Research Ethics Committee (HREC) of the University of Canberra on 17th July 2014 (Project number 14-142). It is worth mentioning that at this stage I faced some restrictions related to grounded theory, especially for the data collection. In order to better understand individuals' underlying contexts relating to their internet use and non-use, it was necessary for me to look for creative and strategic approaches in seeking interview participants and conducting the interviews, and some of these sparked several concerns from HREC members before full approval was finally given. For example, some of my interview questions, such as "Would you please describe your daily life and activities?" were claimed to be irrelevant. As described above, I carefully considered how to approach individuals to elicit a range of responses and discourses related to their daily lives and ICT, including the internet and digital devices. This example of the committee's response provides evidence of a misunderstanding that exists about the role of technology in the everyday lives of members of society in the 21 century. I deemed the somewhat indirect approach to starting a conversation, using questions that were easy to answer, to be a better way to facilitate conversation in a relaxed mood and not add to participants' discomfort about their non- and limited use of the internet and computer.

Chapter 4 Policy analysis results

4.1. Overview of digital divide policies in Australia

For almost two decades, there have been significant national digital divide policy interventions in remote communities in Australia [Table 4.1]. These initiatives have been based on ABS data and the identification of access and quality gaps between urban and non-urban Australians by the *Regional Telecommunications Inquiry* (Notley & Foth, 2008). Australians living in remote, regional and Indigenous areas tend to be digitally disadvantaged because of the relatively high cost and poor quality of services available to them.

Table 4.1 Summary of digital divide policies in Australia 1997-2006

Policy	Year	Budget	Objectives
Networking the Nation (NTN)	1997 / 1998 - 2004	\$250 million \$351 million	- enhance telecommunications infrastructure and services - promote use of services available through telecommunications networks - reduce disparities in access to services and facilities
Telecommunications action plan for remote Indigenous communities	2002 - 2005	\$8.3 million	- address infrastructure needs of Indigenous communities
Co-ordinated communications infrastructure fund	2004	\$23.7 million	- encourage health, education and other sectors of public interest - maximise opportunities for improved broadband access and services in rural, regional and remote Australia
Communications fund	2005	\$2 billion	- telecommunications services in rural, regional and remote Australia
Connect Australia	2005	\$1.1 billion	- rollout broadband to people living in regional, rural and remote areas - extend mobile phone coverage - build new regional communications networks - set up telecommunications services for remote Indigenous communities
Backing Indigenous ability	2006	\$36.6 million	- redress low levels of telecommunications access and access quality in Indigenous communities

Source: Notley & Foth (2008)

In the following sections, I review each policy scheme with regards to (1) supply-side infrastructure subsidies or support and (2) demand-side user adoption, engagement and skills programs. For reasons of scope, only the main government policy documents designed to bridge the digital divide are used in analysis. For example, four documents published during the NTN program (1997 – 2004) and three documents published during the Connect Australia program (2005 – 2007) are reviewed. In addition, the Department of Communications' Annual Report series published from 2000 to 2015 are also examined for relevant data, such as budget and sub-initiatives. Following these policy schemes, I analyse the National Broadband Network (NBN), which is an ongoing project, along with the National Digital Economy Strategy (NDES), which was designed to provide a vision for realising the benefits of the NBN as a demand driven strategy.

4.2. Networking the Nation (NTN) 1997 – 2004

Objectives

In 1994, the Broadband Services Expert Group (BSEG) was established by the Commonwealth Government to investigate the opportunities and challenges relating to internet in Australia, and how Australia could better prepare and plan for an increasingly digital future. The *Networking Australia's Future* report was released in December 1994. In 1996, the Networking the Nation program was launched by the Australian Government to assist in the economic and social development of rural, remote, and regional areas by funding projects which aimed to:

- enhance telecommunications infrastructure and services in regional, rural and remote areas;
- increase access to, and promote use of, services available through telecommunications networks in regional, rural and remote areas; or
- reduce disparities in access to such services and facilities between Australians in regional, rural or remote areas and those in urban areas.
(Australian National Audit Office (ANAO), 1998/9)

NTN Audit reports note that the initial program objectives were later changed to a broader reference in order to widen the range of projects eligible for funding. By doing so, the objectives became more general, making it difficult to evaluate the program's effectiveness (ANAO, 1998/9)

Funding allocations

The government initially allocated \$250 million to the program, before adding a further \$174 million in 1999. Government funding for the development of infrastructure, services and facilities was allocated based on the proportion of population living outside each state capital city [Table 4.2]. This approach, however, did not account for the higher costs of installing infrastructure across vast distances, and the likelihood that costs would be higher in Western Australia (WA) and the Northern Territory (NT) in comparison to Tasmania.

Table 4.2 Allocation of funds across states and territories

State/Territory	\$ million	% of population outside metropolitan area	% of Funds allocated
New South Wales	37.4	38.0	14.9
Victoria	28.5	28.0	11.4
Queensland	53.1	54.0	21.2
Western Austria	26.5	27.0	10.6
South Australia	26.5	26.0	10.6
Tasmania	58.0	59.0	23.2
Australian Capital Territory (ACT)	4.0	0.1	1.6
Northern Territory	16.0	54.0	6.4
Total	250.0	-	100.0

Source: Networking the Nation Audit Report (Department of Communications, Information Technology and the Arts), p.31

Additional funds of \$174 million from the Social Bonus resulting from the sale of a further 16% of Telstra were allocated to a range of programs designed to improve communications access in regional Australia [Table 4.3].

Table 4.3 Social Bonus funding for NTN

Fund	\$ million	Purpose
Building Additional Rural Networks	70	Building Additional Rural Networks initiatives to promote ongoing, sustainable improvements in regional telecommunications services
Local Government Fund	45	Local Government Fund which will assist authorities in regional Australia to provide online access to information and services
Internet Access Fund	36	Stimulating internet service delivery in regional and rural Australia
Remote and Isolated Islands Fund	20	Improving telecommunications access for remote island communities
Other fund	3	Extended Mobile Telephone Coverage in Western Australia, South Australia and Tasmania
Total	174	

Source: Networking the Nation Board Annual Report (2000)
(see <http://www.dcita.gov.au/annualreport00/appendix.html#append14>)

Sectors and programs: supply-side and demand-side

During the NTN's operation, a total of 762 projects across regional, rural and remote Australia were approved, contributing to a rapid expansion in mobile telephone services, a significant increase in internet literacy, and greater delivery of government, business and consumer services online. Eligibility for funding was limited to not-for-profit organisations, including local councils, regional development organisations, council or community group organisations, local government associations, and state and territory governments.

Telecommunications carriers and service providers participated as providers of services to, or on behalf of, funded organisations⁶.

Excluding research projects, 635 projects were approved with funding totalling \$350.21 million, as shown in Table 4.4. The projects were divided into supply- and demand-sides. The supply-side focused on infrastructure provision, including mobile phone towers, the construction of telecommunications infrastructure (e.g. satellite), internet access, points of presence, and videoconferencing units. The demand-side, namely service provision, included public internet access facilities, technical support, training, and awareness. The former was intended to improve the availability, reach, quality, reliability and choice of communications facilities in regional Australia and, in some cases, to reduce cost. The latter was intended to increase both supply and demand by simultaneously providing services and infrastructure, and building demand for them. Filling gaps in both access and demand was particularly important in areas with the fewest facilities and the least likelihood of commercial provision.

Considerably more funds were allocated to infrastructure provision than service provision. While \$286.71 million was allocated to 547 infrastructure provision programs, accounting for 82% of the total funds, \$64.5 million was budgeted for 215 service provision programs [Table 4.4], which was typical of the ICT policy approach taken by government in the early phase of ICT development. The largest category of NTN project activities was the provision of internet access, particularly public internet access. A total of \$129.31 million, jointly funded by the NTN and state governments, was allocated to 309 projects for developing and upgrading internet facilities in libraries, schools and telecentre networks. CTC@NSW⁷, the

⁶ See DCITA information page available on www.dcita.gov.au

⁷ The Western Australian Telecentre commenced operation in 1991, but the Telecentres models had been funded during the late 1990s by the federal government's NTN program with emphasis on building social capital and providing equity of access to the internet (Lynne, 2013). In 2005, when the initial government funding to each CTC (Community Technology Centres) ceased, the CTC Association was set up to assist in co-ordination of opportunities for the CTCs. The CTCA continues as the peak organisation for CTCs. It is a member-based organisation incorporated under the Associations Incorporation Act 2009. As of June 2015, CTCA had 43 members in NSW and ACT (CTCA Annual Report, 2014/5)

West Australian telecentre program, and Tasmanian Communities Online (TCO)⁸ are examples of internet access provision through public facilities. These programs, which were jointly funded by the NTN and their respective state governments, were established to provide public access to computers, photocopiers, fax machines, the internet and videoconferencing, as well as training to local communities and a range of business and government services. The CTC@NSW program negotiated the delivery of services alongside the Australian Tax Office, the Department of Health and Aged Care's Office of Rural Health, Centrelink, Veterans' Affairs, the Health Insurance Commission, Telstra Country Wide and Westpac's Challenge Bank (Commonwealth of Australia, 2002; 2002).⁹

Table 4.4 NTN Projects

Project Type	Number of projects	Primary activity	Funding (\$ million)
Infrastructure provision			
Mobile telephone infrastructure	110	Provision of digital mobile telephone coverage through the construction of towers, repeaters and base stations.	36.5
Telecommunications infrastructure	25	Provision of links to telecommunications networks, or seeking to develop, trial or test telecommunications equipment.	36.6
Internet points of presence (POP) and/or Internet services	28	Provision of Internet infrastructure and/or services enabling Internet service provider customers to connect to the Internet at the cost of a local call.	19
Internet access	309	Provision and enhancement of facilities and services for public Internet access in libraries, telecentres and cybercafés as well as sectoral access including schools.	129.31
E-commerce and/or other online service delivery	30	Provision of facilities to allow e-commerce or e-business to be provided to end-users by service providers, including secure electronic trading facilities, regional portals or gateways and brokering of e-business through an online system.	44.1
Websites	23	Provision of websites directly to end-users, whether or not those users owned the equipment through which the website service was delivered.	12.7
Other	22	Software development, support, tenders and subsidies.	8.5
Service provision			
Planning assistance	127	Development of a needs analysis, telecommunications strategy, feasibility study or business case	12.3
Training and equipment	30	Developing skills in using personal computers and online services.	18.7
Videoconferencing equipment and/or services	38	Provision of access to videoconferencing facilities to the public or specific groups, offering a live connection to one or more locations for the purpose of communication using images and audio of the people involved.	24.9
Awareness	20	Conducting demonstrations, presentations and similar activities for people in regional, rural and remote communities aimed at improving knowledge of communications facilities, services and applications.	8.6
Total	762		351.21

Source: NTN financial data, CRU evaluation database

⁸ The TCO Program was funded in 1998 and established 64 Centres over a three-year period utilising the NTN funding to provide communities with access to information and communications technology in a non-threatening environment underpinned a more ambitious strategy to build the market for e-government and e-business, accelerating Tasmania's transition towards an information economy. The Tasmanian Government (Department of Education) is the primary sponsor of the TCO network at present, allocated \$1,045,000 in 2015/16 (Tasmanian Government, Department of Education Annual Report, 2015/16).

⁹ See p.193 in *Connecting Regional Australia* and p.66 in *Telecommunications Action Plan for Remote Indigenous Communities*

According to the NTN Program Outputs Report (2004), more than 2.2 million people used internet access facilities funded by the program between 1997 and June 2003. Queensland and Victoria developed the largest number of access centres based on their proportion of the population, with centres established in all regional Victorian libraries and in state libraries in Queensland towns under these projects. Along with the development of telecentres, Rural Transaction Centres (RTC) were also set up in small communities as part of regional ICT services support programs via a budget allocation of \$70 million. Small communities of less than 3000 residents developed their own centres via NTN funding, providing banking, postal, internet, phone, fax, and Medicare claim services, and access to appropriate federal, state and local government services.

In regards to awareness and training, \$27.3 million was spent on 50 projects to increase awareness of the internet and the benefits of online services, specifically providing training equipment and services related to e-commerce and e-business. As a result, according to the NTN Program Outputs Report, 950,000 people had received computer and internet training at NTN-funded facilities by June 2003. Specific telehealth projects were funded to develop and enhance telecommunications with the aim of providing health services, such as clinical advice, consultation, education and training. The majority of the 552 funded videoconferencing facilities were placed in remote or very remote locations. There were also several projects aimed at increasing both demand and supply by subsidising the cost of conversion to digital technology for households in remote communities. Spending on these projects totalled \$6 million.

Policy targets/beneficiaries

Table 4.5 shows increased internet penetration in the first three years of NTN policy along with sharply increased expenditure. Considerable and increasing funds were spent until 2002, except between the years 2000 and 2001, when additional funding allocations were followed-up. After 2002, a consistent general decrease was seen until 2005.

Table 4.5 NTN Funding paid to projects by financial year and Internet penetration

Financial year	Expenditure (\$ million)	Proportion of total funding (%)	Internet penetration
1997–98	11.2	3	16.37
1998–99	24.3	7	30.81
1999–2000	70.3	20	40.78
2000–01	47.1	13	46.76
2001–02	82.4	23	52.69
2002–03	69.6	20	
2003–04	31.2	10	
2004–05	15.4	4	63 (2006)
Total	351.3	100	

Source: NTN financial data, Departmental financial reporting system; ABS

State government was the most funded recipient during the NTN program, receiving \$115.2 million, which was spent on large telecentre networks and internet access in state libraries [Table 4.6]. Nevertheless, community groups were recipients of 163 projects, but these involved smaller amounts of funding than the projects delivered to other types of organisations.

Table 4.6 NTN Funding by recipient type and funding amount

Recipient	Number of projects	Average funding (\$'000)	Total funding (\$ million)
State government	71	1 623	115.2
Local government	175	233	40.7
Local government associations	58	881	51.1
Business and regional development boards	130	301	39.2
Community groups	163	128	21
Representative and peak bodies	45	347	15.6
Education institutions	45	278	12.5
Other	75	747	56
Total	762	460.9	351.2

Source: NTN administrative database

The majority of the NTN projects (78.9%) did not define a specific target group, and the projects which targeted specific social groups (21.1%) were much less involved [Table 4.7]. In the 21.1% of projects where a target group was specified, 44% (71 out of 161) were designed for Indigenous groups.

Table 4.7 NTN Project target groups

Project target group	Number of projects	Proportion of all projects (%)
Indigenous	71	9.3
Business	30	3.9
Youth	18	2.4
Disabled	16	2.1
Disadvantaged*	8	1
Aged	8	1
Farmers	5	0.7
Women	5	0.7
No specific target group	601	78.9
Total	762	100

Source: NTN administrative database

*No further definition of 'disadvantaged' groups was in the database.

There was also leveraging of funding programs supplemented by other sources. The largest of these was the Connecting Tasmanian Schools project, which had a total budget of \$48 million. NTN provided \$27 million, with Telstra providing \$5 million and the Tasmanian Government providing a further \$16 million. Launched on October 6, 2000, the project aimed to establish local area and wide area networks linking Tasmanian schools, and to provide computer facilities for them (Australian Government, 2000-1, see <http://www.budget.gov.au/2000-01/minst/html/transp.htm>). Other state government programs assisted by NTN funding include Skills.net in Victoria, Networks for You in South Australia, OPEN IT in Tasmania, and TeleSENIOR and TeleYOUTH in Western Australia.

The first phase of NTN policy in Australia was predominantly focused on network infrastructure provision and follow-ups to extend coverage and access facilities, such as telecentres, particularly in regional areas. During the NTN's operation, steadily increasing access to and use of communication services among households in non-metropolitan areas was observed. As a result, evaluations of the programs were largely positive in terms of their contribution to reducing intra-regional disparities, increasing the availability of online communication services and internet access, and promoting awareness, training and public internet facilities to regional users (DCITA, 2004). However, a few years later, critiques of the programs emerged in the academic field, mainly in terms of their failure to address the need for access to internet services, including high-speed internet services, at the local level (Hearn, Simpson, Lennie & Kimber, 2004; Fan, 2008).

Although the digital divide has been the centre of policy from the initial stage of ICT development, major initiatives aimed at internet access have predominantly been focused on

access provision in regional areas, with little focus given to demand-targets which include more complex barriers that significantly determine utility among people in regional areas. An approach skewed to the geographic divide is reflected in the fact that concerns raised in documents lack an accompanying identification of policy targets. For example, the Telecommunications Service Inquiry (TSI) (2000) includes a recommendation that the NTN program needs to encourage more structured and targeted funding programs to assist communities in meeting their communication needs.

4.2.1. Telecommunications Action Plan for Remote Indigenous Communities (TAPRIC)

In 2000, as part of the TSI into the status of telecommunications in regional Australia, the Federal Government released a report assessing and certifying the adequacy of various telecommunications services. In this report, concern was expressed about the low access and use of the internet among non-metropolitan households, urging particular attention and support to be dedicated to the development of telecommunications services in regional, rural and remote areas:

Although since 1998 the number of non-metropolitan households online has increased at a greater rate than metropolitan households, the current difference in access rates between metropolitan and other areas is expected to grow. Low usage in rural and remote areas is likely to be a function of both supply and demand factors. The main supply barrier is infrastructure constraint – the inability to access the internet at reasonable speeds through the terrestrial customer access network. This affects around five percent of urban and provincial customers and 15 percent of rural and remote customers. (p. 42)

In response to TSI Recommendation 17, which addressed special needs in remote indigenous communities, the government announced a Telecommunications Action Plan for Remote Indigenous Communities (TAPRIC) to “provide a strategic framework under which effective, coordinated action can be initiated and expanded into the future”. In the Action Plan (2002) report, the importance of understanding local contexts to meet community development needs, as well as the crucial role of supply- and demand-side strategies, was prominent and emphasised:

It is important to understand this policy and program environment in order to assess to what extent it is meeting the needs of remote Indigenous communities, and whether policy and program settings could be adjusted to deliver better outcomes for these communities. (DCITA, 2012, p.23)

In a further Government initiative which illustrates the need for a cooperative approach to telecommunications programs, a Broadband Advisory Group has

been established to advise on both supply and demand side initiatives to further develop broadband in Australia. The Group will provide high level advice on both supply-side and demand-side issues, including possible policy solutions to current and future challenges and the opportunities presented by emerging technologies and new business models. (DCITA, 2012, pp.23-24)

Objectives

Three objectives of the Action Plan were defined:

- Improve telecommunications services and online content
- Improve information flows
- Improve coordination and support, and facilitate partnerships

There were 15 strategies for action of which two were involved in development of online access centres and points which were focused on community empowerment and skills acquisition among residents in ‘Hub’ and ‘non-Hub’ communities. Also, online content development focused on local contexts to meet the specific needs of indigenous users, such as cultural and language content development and content for narrow bandwidth application.

Funding allocations / programs

\$8.3 million was allocated in 2002 to the following initiatives:

- provision of 149 satellite service connected computer packages to 135 remote indigenous communities, including help desk services and a manual User Guide;
- a report on the feasibility of establishing online access centres in remote indigenous communities and the development and distribution of a “toolkit” designed to help communities establish their own sustainable centres;
- a mobile telecommunications training and education service to visit eight regions of remote Australia and provide one-on-one and small group training;
- development of interactive language preservation and education software packages for three indigenous communities;
- a grants program to fund the development of online content relevant to remote indigenous communities; and
- the launch in March 2004 of the Community Phones Programme to develop improved and culturally appropriate telephone services for remote indigenous communities.

A total of \$2.3 million in 2003-04 and \$3.104 million in 2004-05 was allocated to TAPRIC initiatives such as the Community Phones Program (CPP).

Along with emerging demand-side issues, concerns about connection, particularly related to its quality (such as in terms of reliability and speed in regional areas), were raised. The lack of bandwidth to support high quality internet access was recognised as a barrier to the take-up of internet services, which more concerned markets than service obligations did:

The majority of remote Indigenous communities do not currently have terrestrial access to high bandwidth services, either because their communities do not support a business case for its supply, or because there is insufficient backbone connectivity to the available network (Telstra is the only relevant terrestrial backbone provider to these communities). Commercial roll-out of bandwidth is generally to higher populated areas, particularly those that are on inter-capital or inter-regional trunk routes. (DCITA, 2002, p. 62)

However, it was also noted that infrastructure enhancement to support higher speeds across all communities is very costly. In particular, a more cost-effective solution was deemed necessary in the case of smaller communities in order to ensure business feasibility.

For smaller and more remote communities, higher bandwidth will not be feasible unless the majority of potential users of services cooperate to aggregate their demand for services. (DCITA, 2012, p. 62)

Therefore, demand-side initiatives aimed both at increasing the profitability of the roll-out of broadband infrastructure in the business plans of telecommunications companies and at improving existing infrastructure, such as in a demand aggregation model, were involved in the Action Plan. As well as this, videoconferencing, government information and transaction services were used as methods to generate demand for bandwidth. The Government's market-based approach to access development, however, resulted in inequitable access development between metropolitan and regional areas of Australia, such that basic internet access needs were addressed without consideration of the long term demands of regional residents.

In terms of mobile service, satellite mobile services were suggested in the TAPRIC report as an alternative mobile phone service for remote areas because of the associated lower initial investment cost beyond the handset, making satellite mobile more successful in take-up than terrestrial services in such areas. However, higher expenses associated with handsets and call charges were considered more likely for this service than for a terrestrial mobile service, which was recognised as a barrier to up-take. The Western Australian Government supported

people in remote areas of the state through the satellite phone subsidy program, which formed part of the NTN. The scheme provided a subsidy of \$1,000 per handset.

Policy targets/beneficiaries

TAPRIC was initiated to improve telecommunications services in remote indigenous communities by implementing a range of communications-related programs and strategies to achieve realistic and sustainable solutions. It was intended to complement the supply-driven NTN project, such that more demand-side targets, especially in indigenous communities, were emphasised through training, education and content development. Furthermore, an attempt to specify policy target groups through a framework for determining likely service priorities was presented in the Action Plan report. Four dimensions of community service priorities were identified according to differences in the accessibility of facilities and support in hub and non-hub communities¹⁰, as well as differences in levels of readiness (high and low): the presence of community leadership; education levels, targeted projects and degree of community social cohesion and unity; and strong cultural identity. Each dimension was listed alongside different degrees of supply- and demand-side provisions, such as in terms of types of connection, supporting facilities and content. For instance, a basic level of internet access provision, awareness-raising, and training was more emphasised for non-hub communities with a low level of readiness. For hub communities with a high level of readiness, higher bandwidth access with more online access facility provision was suggested to enhance a greater range of demands for different online services and e-commerce support for local businesses. This framework for remote indigenous communities was the first attempt to develop an approach to determining likely service provision that considered readiness to use services; however, approaches based on community demographics still appear to be limited to geographically isolated populations in regional Australia.

¹⁰ Hub communities are Indigenous communities which provide regular visits based services (e.g. schools and medical centres), and non-hub communities are small communities or out stations with up to approximately 50 people in permanent or semi-permanent residence, with at least a water supply and shelter (DCITA, 2002, *Telecommunications Action Plan for Remote Indigenous Communities*, p.37).

4.3. National Broadband Strategy (NBS) 2003 – 2007

The National Broadband Strategy Implementation Group (NBSIG) was established in 2003 by the Australian Government to develop and implement the Nation Broadband Strategy in response to a recommendation of the Broadband Advisory Group (BAG).¹¹

#Recommendations: National Strategy and Implementation

The Government should adopt a Nation Broadband Strategy.
The Government should establish a National Broadband Strategy Implementation Group to oversee implementation of the actions in the national strategy and to review and evaluate its progress.

The Broadband Advisory Group's report (2003) explained the necessity of the establishment of the Nation Broadband Strategy, emphasising the importance of broadband networks to economic and social development in Australia.

Broadband networks will be an important enabler, providing key infrastructure for the information economy. Just as road and rail infrastructure has been critical to the effective functioning of an industrial economy, so is broadband infrastructure critical for the information economy. There are two important reasons why a holistic approach to broadband should be adopted. The first is the pursuit of economic efficiency and innovation. Broadband networks are a platform for economic growth and structural transformation. The second is 'nation-building' or 'community-building'. Broadband networks are a platform for enhancing social, cultural and national cohesion. (p.10)

It is notable that the report well documents the benefits of broadband both to the economy and to society, in particular by positioning broadband as a public good.

Some months after the BAG report, in early 2004, the government announced a National Broadband Strategy. This strategy suggested the critical role that broadband must play in Australia, as well as provided a vision for future Australia.

Australia will be a world leader in the availability and effective use of broadband, to deliver enhanced outcomes in health, education, community, commerce, and government and to capture the economic and social benefits of broadband connectivity.

The report explained the importance of broadband and the government's objectives in developing it in Australia. Several primary issues on which the government would focus were

¹¹ The BAG was established in March 2002 as an expert body to provide high level advice to the Government on higher bandwidth issues. The BAG's role is to assist the Government so that its higher bandwidth policy framework optimises the economic and social benefits that Australians derive from higher bandwidth services. The group was disbanded in 2003 (DCITA, 2002, *Connecting regional Australia – the Report of the Regional Telecommunications Inquiry*, p.210)

outlined: national coordination, government expenditure, building user understanding, skills, Australian digital content, demand aggregation, protection of critical information infrastructure, and planning and urban development. Key priority sections were also identified: regional areas; rural and remote areas; small and medium enterprises (SMEs); communities; health; education; research; and advanced industries. Furthermore, the advisory group urged the government to strategically invest in developing services in regional areas, recommending investment incentives and a public-private partnerships model. The advisory group believed that such initiatives would develop services that may not otherwise be commercially viable by catalysing private investment in services, particularly in rural and regional areas. This was a notable change of approach in terms of broadband service development, as it represented a shift from market-driven approaches, particularly by emphasising the importance of both supply- and demand-side interventions.

The total value of Australian government funding for the National Broadband Strategy was \$142.8 million over four years, commencing 2003-04. The majority of funds were allocated to the High Bandwidth Incentive Scheme (HiBIS), which aimed to provide regional Australians with access to higher bandwidth services at low prices by providing incentive payments to Internet Service Providers (ISPs). Furthermore, different types of demand-side initiatives were adopted to improve broadband access and content in regional areas through service providers and to stimulate the take-up of broadband among communities. Demand aggregation programs and subsidy schemes are examples of such initiatives.

Funding in the National Broadband Strategy between 2004 and 2008 was also allocated to several programs, as shown in Table 4.8.

Supply-side initiatives

NBS supply-side initiatives include the “Higher Bandwidth Incentive Scheme (HiBIS)” and the “Metropolitan Broadband Blackspots Programme”, both of which focus on improving access in regional and metropolitan areas where such services are not available.

In 2002, the *Regional Telecommunications Inquiry* report was published as part of an inquiry into the status of telecommunications in regional Australia. Following an investigation, the report identified two crucial points: the importance of the internet to users across Australia, and that the key concerns of consumers with dial-up internet services were data speeds and service reliability.

The importance of telecommunications is clearly shifting from basic voice and data services to access to information highway services in education, healthcare, community services, commerce and entertainment...the advent of high-speed broadband technology creates a new window of opportunity to secure a quantum shift in the delivery of services to rural and regional Australia.

The Inquiry believed strongly that the real issue facing many regional, rural and remote consumers was being faced by dial-up Internet users more generally—the performance of dial-up technology was not able to meet the growing expectations of many consumers for a faster and better internet experience. Therefore, the Inquiry recommended:

The Government should establish an incentive scheme for the provision of higher bandwidth services to regional, rural and remote areas, to enable all Australians to have access to services at prices comparable to those prevailing in metropolitan areas. (Recommend 6.3)

As the government's response to the recommendation, HiBIS was initiated to supply higher bandwidth services in regional, rural and remote areas at prices comparable to those available in metropolitan areas.

Metro Broadband Connect was also developed in response to the Regional Telecommunications Inquiry and the Government's Broadband Advisory Group. The NBS identifies that "government has an important role to play both in enabling market driven broadband outcomes and in facilitating broadband access in areas where the market may not provide services at fair and reasonable prices within an acceptable timeframe" (National Broadband Strategy, p.3). Metro Broadband Connect was targeted at residential customers, small businesses and small not-for-profit organisations. The Program applies to the capital cities of Australia and adjacent designated high population centres. In addition, "Expansion of Terrestrial Mobile Phone Coverage Programme" was also implemented to increase and improve mobile phone coverage in regional Australia.

The government announced that an additional \$15.9 million would be spent over three years from 2004-05 to increase and improve mobile phone coverage in regional Australia. Telstra was the tenderer and was to construct new mobile phone facilities at 62 regional locations.

Table 4.8 NBS programmes

Dimension	Policy	Year	Budget (million)	Objectives
Supply-side	Higher Bandwidth Incentive Scheme (HiBIS)	2004 - 2007	\$157.8	To provide regional Australians with access to higher bandwidth services (broadband) at prices comparable to those available in metropolitan Australia
	The Metropolitan Broadband Blackspots Programme	2005-2008	\$50	To provide access to equitably priced broadband services in metropolitan areas where such services are not available
	Expansion of Terrestrial Mobile Phone Coverage Programme	2004-07	\$15.9	To increase and improve mobile phone coverage in regional Australia
Demand-side	Coordinated Communications Infrastructure Fund	2003-2007	\$23.7	To fund broadband infrastructure development in regional, rural and remote areas (support improvements in the delivery of health, education, government and other services)
	Demand Aggregation Broker Programme	2005-06	\$4.7	For broadband development strategies to be developed at the national, state and community level. To improve broadband access and application To develop broadband demand aggregation projects, both across sectors and within particular geographic areas To assist community organisations to aggregate demand in their region and to negotiate with telecommunications service providers to progress broadband rollout in their local area
	Launceston Broadband Project	2000-2006	\$30	Joint initiative between the Australian Government and Telstra: To help Tasmania to participate in the commercial opportunities offered by the information economy
	Consumer Representation and Research Grants	2002-06	\$3.4	To provide for consumer representation and research in telecommunications.
	IT training in very remote communities	2004-08	\$8.8	To provide people and organisations located in very remote areas of Australia with better access to basic information computer technology training and technical support
	Satellite phone handset subsidy scheme	2003-07	\$3	To subsidise maritime and aviation users as well as terrestrial users

Source: Australian Government, Budget 2005-6 (see <http://www.budget.gov.au/2005-06/ministerial/html/dotars-17.htm>)

Demand-side initiatives

The *Regional Telecommunications Inquiry* identified the persistently disadvantaged status of regional services, recognising that there are a number of broad social issues that impact the take-up of telecommunications. As a result of these findings, the report supported a coordinated, holistic effort by governments and other stakeholders that would aim to take effective action into the future, as was suggested in TAPRIC. Accordingly, the importance of future financial support to improving telecommunications in remote indigenous communities was acknowledged.

The direction of the Telecommunications Action Plan for Remote Indigenous Communities is supported as providing a holistic and well-targeted way forward. Significant funds are currently being applied to meet the needs of remote Indigenous communities, but fully meeting the needs of these communities presents long term challenges, and further funding will be required in the future.

The increasing recognition of demand-side barriers to ICT adoption in regional areas led to a more diverse demand-driven approach in the NBS that targeted disadvantaged communities. For example, in 2004, as part of its response to the *Regional Telecommunications Inquiry*, the government announced the “Coordinated Communications Infrastructure Fund (CCIF)” and allocated \$23.7 million to further developing broadband infrastructure in regional areas, especially focusing on developing the health and education sectors and government services. The “Demand Aggregation Broker Program (the DA Broker Program)” was also announced as part of the Australian Government’s response to the inquiry. It aimed at coordinating the potential demand of consumers in order to ensure efficient resource allocation and the obtainment of economies of scale, so as to increase the profitability of network rollout.

In addition to these projects, demand subsidies, research grants and IT training were implemented in very remote communities while NBS was active. There was also a project targeting a certain region, Launceston in Northern Tasmania, which was jointly funded by Telstra and the Commonwealth. Following the first round of legislation, which led to a \$58 million funding allocation to Tasmania under the Regional Telecommunications Infrastructure Fund (see Table 4.2), more than a billion dollars was allocated from sale proceeds for a “social bonus” (Given, 2010). Accordingly, the Launceston Broadband

Project¹² was funded as part of the Telstra Social Bonus Package, with \$15 million provided by the Australian Government and \$15 million by Telstra to launch a broadband venture, the Broadband eLab (B-eLab). The objective of the project was to introduce new online applications through market trials and deployment of new products, operate a broadband applications test bed and stimulate new high-technology business opportunities in the Launceston region. Funds were also allocated to subsidise households and businesses in Launceston and to a business development fund designed to foster high-tech businesses. The Launceston Broadband Project was extended in April 2004 until June 2006. The extended project aimed to stimulate new high-tech business opportunities in Launceston by increasing the participation levels of the Launceston information and communications technology community. Telstra evaluates the project to have “resulted in valuable customer experience and usage information that has been used to improve applications and services prior to launch” (Given, 2010, p.135). However, the argument has been made by industry groups that the Telstra B-eLab did not deliver on its promise to either Launceston or the Tasmanian IT industry (Keen, Steer, & Turner, 2008).

While initial NTN programs were mainly focused on supply-targets aimed at the provision of broadband infrastructure and services and the take-up of internet among the population, the following initiatives implemented through the NBS were focused on connectivity improvement in regional areas through substantial funds allocation to the HiBIS, which reopened the Regional Telecommunications Inquiry. Furthermore, a range of demand-side policies and initiatives emerged during the NBS period (2003 to 2007), which suggests increasing recognition of the importance of the demand-side and improving broadband products or services and use through the consumer side in regional areas. In particular, along with the HiBIS, a large sum of funds was allocated to initiatives that supported the rollout of new broadband infrastructure networks in regional areas between 2005 and 2007, which is discussed in the next section.

4.3.1. Connect Australia (2005-2007)

In August 2005, the government announced its largest regional telecommunications assistance program yet – the new \$1.1 billion Connect Australia program over four years.

¹² See ABS Launceston Broadband Project
<http://www.abs.gov.au/ausstats/abs@.nsf/0/EFD3F3101744A12DCA2573C5000D9D42?opendocument>

While the HiBIS was implemented to improve broadband access in regional communities in Australia, the Connect Australia package was to provide affordable broadband to residents in regional, rural and remote areas, extending mobile phone coverage, building new regional communications networks and establishing vital telecommunications services for remote indigenous communities. Demand-side efforts in the Connect Australia project were focused on increasing the public's need to connect. Funds were allocated to the Broadband Connect program, which aimed to connect homes, small businesses and not-for-profit organisations to fast, reliable and affordable broadband services [Table 4.9]. Broadband Connect also supported resolving the remaining broadband blackspots in metropolitan areas (\$50 million).

Table 4.9 Broadband Connect programmes

Programme	Type	Target	Budget (million)	Objectives (program)
Broadband Connect	Supply	2005-2008	\$878	to provide all Australians with affordable broadband services (incentive payments to supply higher bandwidth services)
Clever Networks	Demand	2005-2008	\$113	to rollout new broadband networks for innovative applications and infrastructure to improve the delivery of health, education and other essential services (Innovative Services Delivery/ Broadband Development)
Mobile Connect	Supply/demand	2005-2008	\$30	to extend terrestrial mobile coverage to areas where they can be commercially maintained and continue satellite handset subsidies for other areas
Backing Indigenous Ability	Demand	2005-2008	\$90	to deliver a comprehensive package addressing phones, Internet and videoconferencing in remote Indigenous communities and improved Indigenous radio and television

Source: DCITA Web archive (http://webarchive.nla.gov.au/gov/20060921090304/http://www.dcita.gov.au/tel/connect_australia)

A total of \$113 million was allocated to the Clever Networks initiative, which supported the rollout of new broadband infrastructure networks by providing funding for innovative services delivery. Funds were spent on broadband network provision in regional areas, providing for applications development that would improve the delivery of health, education and other essential services. It also directed more funding towards higher speed advanced networks and applications targeting health clinics, emergency services, schools, TAFE colleges, homesteads for distance learning, and universities.

In order to extend mobile phone coverage to smaller regional communities and along highways, the \$30 million Mobile Connect program was implemented. The program also extended the existing Satellite Phone Subsidy Scheme, which offered up to \$1500 to people who live or work in areas without terrestrial mobile phone coverage for the purchase of a satellite phone. The Scheme was initiated in 2002 to make mobile communications more accessible and affordable than CDMA (Code Division Multiple Access), 3G or GSM (Global System for Mobile Communications) terrestrial mobile coverage for people living or working in the most remote parts of Australia. Beneficiaries included individuals, small businesses, community groups, not-for-profit organisations, indigenous corporations, volunteer emergency services and educational institutions. The government allocated \$88.2 million from 2002 to 2004 to improving and extending mobile phone coverage, of which \$37.7 million contributed to the capital cost of terrestrial base stations in population centres of 500 and above, subject to the confirmation of community need and ongoing viability. A further \$50.5 million was used to support other ways of improving coverage and \$2.1 million was allocated to a satellite handset subsidy program. Another \$40.8 million was allocated to providing improved mobile phone coverage on specific highways and in selected towns with a population of less than 500.

The Regional Telecommunications Review (2008) reported growing concerns about a lack of terrestrial mobile coverage, satellite mobile phone quality, higher prices for mobile phone services as a result of limited terrestrial mobile phone coverage, and the relatively higher price of mobile satellite services. However, it also reported the growing significance of mobile phone use for the economic and social wellbeing of people and businesses in regional communities. The committee recommended the government create a new policy framework to address these issues with mobile phone services, recommending a continuation of the Satellite Phone Subsidy Scheme and exhorting telecommunication providers to provide consistent, accurate and clear information regarding hand-held land mass or geographic coverage.

Finally, the \$90 million Backing Indigenous Ability (BIA) program was carried out to target telecommunications service extensions in remote indigenous communities by providing community phones to hundreds of remote communities, upgrading and supporting public internet access points, replacing ageing and unreliable radio infrastructure, and strengthening access to the cultural benefits of indigenous television. As a type of demand-side policy (incentives to private demand), this policy aims at targeting weak segments of potential

demand, characterised by a low propensity/ability to use novel technologies, in this case, the residents of rural communities. In this program, five key elements were identified to achieve its goals: services, engagement, content development, training and support, and sustainability.

Connect Australia is to provide improved broadband to regional, rural and remote areas, increase local needs for community and local development and further technically and financially sustain the telecommunications delivered to indigenous communities. The considerable funding package is acknowledged for its critical role in the future of broadband in Australia, particularly in rural and regional areas (Australian Government, 2006). The Higher Bandwidth Incentive Scheme was enhanced through the Broadband Connect project with the largest funding package among the Connect Australia programs. The Satellite Phone Subsidy Scheme was also extended through Broadband Connect, which suggests the government's continuing support of people in regional areas through reducing the initial cost of set up, which can ultimately increase the affordability of devices and access. Along with continuing incentive programs for both service providers and consumers, a range of demand-side initiatives were included in the programs, which especially focused on more targeted funding allocations to fulfil end user needs for equipment, training and internet content. The BIA program is an example of this, as it sought to address demand-side barriers through the provision of IT training and technical support, and the development of enabled ICT content, such as e-learning.

In the following section, the National Broadband Network (NBN) will be reviewed along with the demand-driven project, the National Digital Economy Strategy (NDES).

4.4. National Broadband Network (NBN) 2009 – 2015

As the next major phase in Australian internet access policy, the NBN was launched in April 2009 following a long contentious political process that began when Kevin Rudd confirmed the Labor Party's plan to build a national broadband network in his 2007 electoral campaign. In 2009, the Australian Government announced a NBN plan that would adopt a public-private partnership (PPP) model (Conroy, 2009). However, an implementation study conducted in 2010 concluded that the estimated rate of return was insufficient to attract private investors (Given, 2010). Consequently, the government announced a shift away from the PPP model, with NBN to be fully government funded instead (Falch & Henten, 2010). At this time, the Department of Communications, Information Technology and the Arts

(DCITA), which was responsible for broadband and internet access related issues, was renamed the Department of Broadband, Communications and the Digital Economy (DBCDE).

The NBN policy aimed to make Australia a leading digital economy by 2021 by providing a network that would cover 100% of premises, with 93% of homes, schools and businesses accessing speeds up to 100 Mbps over fibre (100 times faster than those currently used by most people), with the remainder of people from remote areas accessing up to 12 Mbps over next generation wireless and satellite. Also, it was announced that the NBN would directly support up to 25,000 local jobs every year, on average, over the 8-year life of the project. A government business enterprise, the National Broadband Network Company (NBN Co), was set up to design, build and operate the open network. The estimated cost to build a broadband network covering all of Australia was \$43 billion.

Both urban and regional areas were included as targets of broadband services in the NBN project. Broadband was expected to be rolled-out simultaneously in metropolitan, regional, and rural areas. Roll-out began in Tasmania in July 2009 and the first services went live a year later. In addition, the supply of two satellites for remote access and provision of point-to-point wireless services was also contracted.

With the election of the Abbott government in 2013, the Rudd government's NBN was reformed, particularly in terms of network design. While the original implementation was to be FTTP (Fibre To The Premises), the change in government after the 2013 election triggered a re-assessment of the NBN. The Abbott government favoured a multi-technology approach, which was expected to reduce costs and facilitate completion by 2019. The changed policy goal was 25 megabits per second as the new minimum speed across Australia, and 50 megabits to 90% of Australia by 2019. The total funding required for the new NBN program was \$29.5 billion (Falch & Henten, 2010). The issue of which technology to use was directly related to expenditure and the timeline for implementation, which were the most contentious subjects surrounding the NBN. While Labor's FTTP network promised to initially provide download speeds up to 1 Gbps, 20 times faster than the Coalition's FTTN (Fibre To The Node) network, the Coalition's network was estimated to cost only two-thirds of the FTTP network, which was why "lower-cost" was the major argument used to garner support for the Abbott government's network. However, the fact that the speed promised by the Coalition's

NBN strategy was lower than initially promised by Labor put it under fire, as Australia had been lagging behind the OECD in terms of broadband speed (Shepherd, 2014).

The NBN is recognised in the *Regional Telecommunications Review* as significantly enhancing communications capabilities across Australia. In other words, it functions as an enabling platform for further improving services and content delivery in all areas of Australia.

With the significant changes likely to occur from the Australian Government's proposed National Broadband Network (NBN) there is now an opportunity to revolutionise the availability and quality of telecommunications services in this country, including all of regional Australia.

(Regional Telecommunications Independent Review Committee Report, 2008)

The NBN is an intensive supply-driven project focusing on the provision of broadband infrastructure and the take-up of internet use among Australians. While the initial broadband building project, NTN program focused very much on building network infrastructure and increasing public access points, stimulated demand has led to a more diverse approach in the NBN, with a series of digital inclusion initiatives that aim to facilitate and encourage both public and private sector interventions through the National Digital Economy Strategy. The demand-driven strategy aims to encourage the wider use of ICT and drive deeper change among specific social and economic sectors in society.

4.4.1. The National Digital Economy Strategy

The Australian Government's report titled *Australia's Digital Economy: Future Directions* (2009) outlined a vision for the digital economy and a framework for maximising Australia's online participation, including key roles for government, industry and the community. It emphasised the importance of the digital economy encompassing the entire Australian economy and numerous sectors of Australian society, and defined the digital economy as:

The global network of economic and social activities that are enabled by information and communications technologies, such as the internet, mobile and sensor networks

The digital economy comprises the computers, phones, game consoles and devices most of us use each day. It is the ability to start up a web browser and search for a local restaurant, to send a text message to your friend or to use a navigational device in your car. The digital economy includes paying for goods with your debit or credit card at the store, or when your doctor receives your pathology results electronically. (DBCDE, 2009, p.2)

Following this, in 2011, the Australian government launched the National Digital Economy Strategy (NDES), which emphasises policies relating to much of the demand-side of Australia's digital future, along with the NBN plan. In the NDES, the digital economy is anticipated to generate socio-economic benefits. The Australian government sets its vision that, by 2020, Australia will be among the world's leading digital economies through eight "Digital Economy Goals":

- online participation by Australian households
- online engagement by Australian businesses and not-for-profit organisations
- smart management of our environment and infrastructure
- improved health and aged care
- expanded online education
- increased teleworking
- improved online government service delivery and engagement
- greater digital engagement in regional Australia (DBCDE, 2011)

Benefits that are generated from effective participation in the digital economy, such as access to services and information and connections to the social community, highlight its importance. It was anticipated that connected Australian households would save \$2.4 billion a year as a result of saving time completing their social and economic activities online, such as teleworking, online shopping, social networking and online service delivery. Along with its economic benefits, the NBN was intended to deliver substantial social outcomes, such as increased engagement and participation among community groups. In order for Australians to be able to utilise improved online networks, the NDES highlighted the importance of developing digital literacy skills among Australians. The concept of digital inclusion was used to define the social benefits of online participation and engagement. The potential to address exclusion via increasing social connectivity in Australia, particularly in light of Australia's large proportion of remote areas, was particularly highlighted.

The internet and mobile networks are allowing consumers to create, connect and engage with people online on unprecedented levels. This can reduce feelings of isolation and enhance family relationships through greater interaction with extended family and the wider national and global community... Enhanced digital engagement can be of particular value to families and/or family members who are geographically isolated or who live away from home. (DBCDE, 2011, p.21)

Along with isolation among indigenous Australians and residents in remote areas, persistently lower internet adoption rates among certain social groups, such as seniors, low-income earners and disabled people, was also included in discussion of digital exclusion, as based on the annual ABS report on *Household Use of IT*.

In order to address digital exclusion, several inclusion programs have been established [Table 4.10]. For example, the “Digital Communities” and “Broadband for Seniors” initiatives were promised funding of \$23.8 million and \$10.4 million respectively. Furthermore, the “Digital Local Government” program and “Digital Enterprise” initiative were also implemented to maximise the productivity benefits of digital services and technologies. For example, the Digital Enterprise program aimed to provide training and support to small and medium-sized enterprises (SMEs) and not-for-profit (NFP) organisations.

Table 4.10 Main digital inclusion initiatives

Programme	Budget (million)	Period	Target	Achievements
Digital Communities (Digital Hubs)	\$23.8 (\$13.6)	2012-2015	Local residents	73,000 training sessions 140,000 participants 93% of respondents satisfied with training/believe the content to be useful
Broadband for Seniors	\$10.4	2008-ongoing	Seniors	2000 sites/94,000 seniors (84% increased internet usage; 85% level improved)
Digital Local Government	\$15	2012-2015	Local governments	47 local councils (grant funding) to develop and deliver online services to homes/businesses (Improving delivery of health services, disaster management, 3D modelling/ mapping, development applications and HD videoconferencing)
Digital Enterprise	\$12.4	2012-2016	Local businesses /not-for-profit groups	13,000 training/mentoring sessions 42,000participants (96% of participants found the training useful and easy to understand, 87% intended to increase their online presence/activity)

Source: Annual Report 2007-15 of Department of Communications (DC)

The government provided \$23.8 million over three years for a Digital Communities initiative to narrow the gap between those who engage in the digital economy and those who do not. A key focus of the Digital Communities initiative was to establish a “Digital Hub” in the initial 40 communities where NBN was to be connected. These Digital Hubs provided opportunities for residents to experience NBN services and learn the skills required to engage with digital services and content, such as social networking, digital information resources, cybersecurity and cybersafety. The approach of Digital Hubs involved a mix of group sessions and one-on-one tutorials which allowed participants with different levels of knowledge and skills to engage in the program, thereby fulfilling a critical aim of the program. The Digital Hub

program ended on 30 June 2015¹³, and in total, delivered over 73,000 training sessions to 140,000 local residents.

The last goal aimed to address Australia's persistent digital divide between metropolitan and regional areas, within regional areas, and, particularly, in business sectors. This goal aimed to significantly narrow the gap between households and businesses in capital cities and those in regional areas. Affordable high-speed broadband access and a uniform national wholesale price were identified as key objectives for the NBN to achieve this goal. In particular, the NBN would aim to extend business opportunities and productivity for regional residents.

...So it's not just about businesses moving from the city into the bush, it's actually enabling country businesses – be they farms or be they small businesses – in towns or regional centres to actually expand their business opportunity. (DBCDE, 2011, p.46)

Digital communities and Digital Enterprise initiatives were promised to deliver economic and social benefits to more than 23 communities in regional Australia by improving access to information, health, education and government services and assisting local businesses and not-for-profit groups, including local cultural institutions, to increase their productivity, expand their customer base and grow their revenues. The conception of enabling technology for local development is a key goal for digital engagement in regional Australia.

4.5. From digital divide to digital inclusion

4.5.1. NTN and the digital divide

Initial ICT policies were predominantly aimed at bridging the gap between non-metropolitan and metropolitan areas, leading to a significant increase in infrastructure development through access and facilities provision. ABS Household Use of Information Technology statistics explicitly show a steady increase in access to and use of the internet in rural and remote areas in Australia.

Although extensive investment in technical infrastructure, including both access availability and government online system development, led to sharply increasing internet penetration and social demand, there was a call to reflect critically on the ICT projects implemented. For

¹³ According the Annual Report of Department of Communications (2014-15), after the program ended, nearly 30 of the funded service providers have incorporated the Digital Hub into the core business of their organisation or have engaged volunteers to continue the activities of the Digital Hubs.

example, Hearn et al. (2004) assessed that ICT development had not played a role in ensuring the sustainability of ICT facilities and services, particularly in regional communities, pointing out supply-driven projects as a reason for failure. They argued that many initiatives were largely ICT supply focused and failed to specify and address local and cultural barriers to adoption, nor increase an awareness of the importance of adoption for local economic advancement. Furthermore, Hearn et al. (2004) criticised the initiatives for not taking into account the dynamics of the global ICT industry, pointing out that emerging digital disparity in ICT use capacity between social groups that resulted from various factors, including affordability, information literacy skills and location, could not be tackled by supply-side policies alone.

While the NTN program was active, several government reports outlined the state of connectivity in Australia and evaluated ICT initiatives already implemented and budgeted. In particular, a significant concern about a relative divide in access and use among regional communities was expressed. For example, the TAPRIC (DCITA, 2002) called for ICT projects to find sustainable ways to address both supply-side and demand-side issues in remote indigenous communities, where private households were unlikely to pay for ICT adoption (Hearn, et al., 2004). NTN projects contributed considerably to public access in small rural and remote communities via the provision of local facilities, such as telecentres (DCITA, 2003). Daly (2007) highlighted the importance of supporting local or community approaches to ICT development to address the needs of communities and actively involve community members in the development process. In her fieldwork, she experienced considerable difficulty finding local people with the relevant skills to work in an online access centre and found that very small budgets were allocated to implementing training programs and providing ongoing support, which was largely due to limited funding allocated to centre operations. Strategies to sustain demand and service delivery are critical components of policy aiming to address the digital divide, and programs should be focused on supplying the needs of local communities in the long term (OECD, 2001).

Furthermore, the fact that the divide has gone beyond the issue of access provision has been consistently recognised in major reports, such as the Telecommunications Service Inquiry (2000), Connecting Regional Australia (2003) and the National Broadband Strategy (2004). In line with these documents, the Broadband Blueprint, released in 2006, also acknowledged differences in use and needs, noting that definitions of adequate connections are also different among users. Disparity in the quality of connections between capital cities and regions has

become a more critical issue in digital divide debates since 2002 (Ewing, Rennie & Thomas, 2015).

Notley and Foth (2008) point out that in the last decade the “Australian government has remained too singularly focused on broadband rollout in the bush” failing to address “more complex demand-side (social and economic) barriers, such as low income, a lack of skills and support and a lack of relevant and appropriate content” (p.5). An approach skewed to the geographic divide is reflected in the fact that concerns raised in documents lack an accompanying identification of policy targets. For example, the Telecommunications Service Inquiry (2000) pointed out a lack of a strategic approach within the NTN program and other funding programs, advising that more structured and targeted funding programs were needed in order for communities to meet different local needs. In particular, it was recognised in the report that untargeted projects, which accounted for the majority of the funded projects (see Table 4.7), were less successful at identifying the specific needs of “a community-wide clientele” in the early phase (p. 174) than all-embracing programs.

While the majority of NTN projects did not initially focus their services on any one group, in practice many NTN projects tended to service particular groups. Women and retirees, for example, were major client groups for many telecentres and training projects, even when those services were initially intended for a community-wide clientele. This appears to have resulted less from conscious policy rather than from the particular services and ambience that developed in particular centres, which tended to attract particular groups. (p.46)

Initial major documents used broad definitions of beneficiaries, which included indigenous Australians and residents living in remote, rural or regional areas. However, several studies show variations in the socioeconomic statuses and lifestyles of residents in rural communities (Ewing, et al., 2015; Singh, Molla, Karanasios & Sargent, 2008), which can impact upon their access and understanding of ICTs. For example, Singh, et al. (2008) identify three different contexts in rural communities; one group is characterised by a relatively vulnerable socioeconomic status in terms of employment, income, education and limited service access and support; the second group is not socially and economically marginalised but digitally deprived; finally, there is a group likely to consist of professionals and retirees enjoying a rural lifestyle. Recognition of the different composition of rural community members is crucial to understanding the different circumstances that shape access to and use of ICTs, as well as various attitudes and perceptions. As observed, there is a lack of understanding of such different contexts among residents of regional areas as a result of merely recognising the

gap between non-urban and urban residents, which initially resulted in an overall absence of specific policy targets.

The government started recognising that a gap still exists, and, in particular, concerns about the sustainability and utility of technical infrastructure, including in terms of access and facilities among people in regional areas, have been raised (DCITA, 2004). One particular point of concern relating to the sustainability of the program's outcomes did emerge in the evaluation report.

These were typically services with the opposite cost characteristics—relatively low establishment costs, but relatively high operating costs and insecure revenue sources. Public Internet access centres tend to fall into this category (DCITA, 2004)¹⁴

According to the report, centres offering training or public internet access reported observing decreasing use of and access to such programs or facilities over time. This was reported to be due to the decreasing needs of initial clients (or visitors) as time passed.

In some cases, the financial viability of a project appears to have been jeopardised by its own success. Projects offering services required by clients for a limited period, or on a transitional basis, are likely to see their clientele shrink as their clients 'graduate' from the service. Centres offering training or public Internet access are typical examples. Clients unfamiliar with computers and the Internet, for example, may seek training at a public Internet access centre and, once introduced to online capabilities, may decide to obtain their own computer and use it from home. (DCITA, 2004)

The observed decrease in the utility of programs or facilities offered at telecentres and libraries, which were considerably budgeted in initial national policy and subsequent initiatives, may reflect demand-side issues, including a lack of specific target groups in the initial policies based on the 'haves and have-nots' perspective.

4.5.2. NBN and digital inclusion

While the NTN program focused very much on building network infrastructure and increasing public access points, the need to stimulate demand led to a more diverse approach in the NBN with a series of digital inclusion initiatives that aimed to facilitate and encourage both public and private sector interventions through the NDES. This demand-driven strategy

¹⁴ See paragraph 4.6 Sustainability of the outcomes on http://webarchive.nla.gov.au/gov/20060916054129/http://www.dcita.gov.au/tel/role_of_the_telecommunications_division_and_contacts/networking_the_nation/evaluation_of_networking_the_nation/evaluation_of_outcomes_and_impacts/4_-_outcomes_of_the_ntn_program/4.6_-_sustainability_of_the_outcomes

emphasised demand-side targets, aiming to encourage the wider use of ICT and drive deeper change among specific social and economic sectors in society (Belloc, et al., 2012). The two plans together formulated a comprehensive approach to increasing the availability and utilisation of broadband (World Economic Forum, 2013). However, it is worth discussing how effectively the Government's strategy for a comprehensive digital inclusion plan has been integrated and implemented.

Prior to the NDES, the NBS also involved demand-side initiatives, such as the "Demand Aggregation Broker Programme" and "IT training in very remote communities". However, the NBS was established to have a complementary role to the NTN programme, in which considerable budgets were allocated to achieve higher bandwidth service provision than the NBS initiatives. The NBN emphasises policies relating to most of the demand-side of Australia's digital future, along with the NDES, which may suggest the importance of the leading role of demand-side policy beyond a mere complementary role.

On the one hand, the growing importance of demand-driven broadband projects may be explained by the shift in a dominant notion underlying broadband policy in Australia, moving from concern about the access divide, to digital inclusion and social inclusion in general. The digital divide has long been a rationale for initial supply-driven projects, leading to optimistic consensus on the outcomes of intensive infrastructure provision that aims to close the digital divide entirely from the access perspective. Consequently, the concept of digital inclusion has recently started emerging in policy documents as an agenda in itself (Notely & Foth, 2008) and has become a crucial rationale for building a digital economy in both the NBN and NDES.

However, while digital inclusion is well acknowledged in policy documents and statements, it appears not to be embedded within practice. For example, the Digital Communities initiative aimed to address the digital divide.

The government provided \$23.8 million over three years for a Digital Communities initiative to narrow the gap between those who engage in the digital economy and those who do not. (DBCDE, 2011, #AU20 NDES, p.22)

The report is not explicit as to who "do not engage in the digital economy" and what "non-engagement in the digital economy" means. In particular, a lack of policy frameworks and targets is clear in terms of digitally excluded social groups.

Without such assistance, there is a very real risk of a widening gap for the most disadvantaged groups, of declining productivity and competitiveness, and of regional communities becoming economically stranded because of a lack of up-take of new technology (DBCDE, 2011, #AU20 NDES, p.22)

Furthermore, the statement highlighting the importance of supporting programs suggests that the access divide perspective still underlies policies in general. Although many policy documents and reports include descriptions of social groups who are less likely to access the internet and are therefore digitally excluded, the government approach to understanding the digitally excluded is very limited, heavily relying on ABS Household Use of Information Technology statistics. While the data clearly shows that instances of social and digital exclusion largely overlap with socioeconomic status and demographic trends, those who are unable to benefit from ICTs and are digitally excluded regardless of their social exclusion status cannot be captured from this approach, a fact that has indeed started to be recognised (Eynon & Geniets, 2011; Livingstone & Helsper, 2007; Park, et al., 2013).

Notley and Foth (2008) commented that “if the concept of digital inclusion is to be progressed by the new Australian government, it will first need to be clearly defined and a policy framework and targets established” (p.13). In line with this, Perlgut (2011) recommends comprehensive research into broadband adoption in Australia, which would include investigation into the characteristics of non-adopters and barriers to adoption in terms of digital inclusion.

In Australia, the recent announcement of a policy focus on social inclusion suggests that this sort of policy integration may be possible. From the perspective of understanding the social impact of ICTs, the key question that will need to be answered is: how does the adoption or use of ICT, or barriers to it, affect the social inclusion of people, or of particular subgroups of the population? (p.13)

Indeed, Ewing, Rennie and Thomas (2015) point out that the NBN project does not cater to all groups, further commenting that:

While clearly aimed at improving Australia’s access to high-speed internet, the issue of access for disadvantaged groups has not been a central one in the debates about the NBN (p.115)

Rather than broader engagement opportunities, the focus of the NBN project is more on service delivery, which is a reflection of the Government’s efficiency-seeking. Furthermore, the underlying goals of efficiency and productivity development are also observed in the supporting programs. As shown in the policy analysis, since soon after the NBN has been

rolled out, there have been different experimental supporting programs, such as Digital Hubs and Digital Enterprise. Given the encouraging achievement of these programs, it is anticipated that there is a growing need for IT support among citizens. Again, as learned from the provision of telecentres in early broadband projects, the sustainability of supporting facilities and programs is a key element of generating effective policy outcomes. The concept of sustainability is based on the idea that the provision of telecentres can bridge the digital divide, as they provide public access to computers as an alternative solution, as well as function as intermediaries that can provide community members with the opportunity to access training and experience in using ICT services (Daly, 2007; Stojilovic, 2012).

Stojilovic (2012) explains that the function of telecentres will remain important over the long term since access to the internet and information will remain difficult in rural and small urban communities. Sustainability has been recognised as one of the most important issues associated with the operation and success of telecentres and training programs (Roman & Colle, 2003). Indeed, an emphasis on continuity rather than infrastructure is one of the key components of a successful and sustainable supporting program (Jung, Park & Lee, 2014). However, such programs are often unlikely to operate for long without the continued intervention and financial support of the government and donor organisations (Colle & Roman, 2003, Daly, 2007; Stover, 2014). Furthermore, the fact that such programs largely rely on volunteers in providing training is also a critical issue, as this can lead to volunteers suffering under a heavy workload and experiencing decreased motivation in the absence of any forms of incentives, thereby compromising the sustainability of a project (Hearn, et al., 2004).

Although a debate exists around where responsibility lies in self-supporting program operations and management (Gumucio Dagron, 2001; Proenza, 2005), a more pressing debate concerns the importance of continuing support for ongoing skills development among community members, as this can lead to citizen-centric digital inclusion. In line with this, Daly (2007) points out that initial policies such as the Broadcasting from Remote Aboriginal Communities Scheme (BRACS) serve as good lessons for future digital inclusion policy in the Australian context, suggesting the need for continuing technical support and a budget for ongoing skills development in regional communities.

It is worth mentioning that the digital inclusion initiatives involved in the NDES, such as the Digital Hub, are limited in understanding their roles in dealing with digital exclusion. The

NDES emphasises the supporting role of Digital Hubs for those who have different needs and difficulties in engaging with ICTs, clearly mentioning that “a critical aspect of Digital Hubs is the inclusion of place-based service which recognises that individual communities have different opportunities and challenges” (p.22). However, while there are opportunities to pursue learning experiences in online services and cybersecurity/safety via the Hubs, how barriers to digital engagement can be addressed by such programs is not explicit. Furthermore, the following statement in the NDES on the risk of digital exclusion implicitly shows that the notion of the access divide remains inherent in the policy.

Fitzgerald, Fletcher and Kop (2016) comment that government initiatives address the digital literacy side of the digital divide based on the assumption that the digital divide could be narrowed if more people learn how to use and access computers and the internet. While this might indeed be a worthy cause and a legitimate assumption, these initiatives fail to take into account how the affordability of telecommunications devices and services impacts on the “digital divide”. Perlgut (2011) emphasises the importance of a comprehensive digital inclusion plan which would run parallel to and complement the NBN roll-out and incorporate the current NDES. In other words, he argues that supporting programs and resources are as important as technological infrastructure and, further, that a comprehensive understanding of digitally excluded members of society is necessary to achieve digital inclusion for all Australians. This may provide an insight into the potential of digital inclusion programs to improve the impact of ICT projects on the lives of beneficiaries.

4.5.3. The shift from digital divide to digital inclusion

Australia has entered a new phase of broadband development since the NBN project commenced. Different connections and variations in the capacity of networks have led policy discussion to include the affordability issue. Furthermore, the emergence of the digital economy has altered the underlying concept of broadband policy and strategy, which has come to include the notion of digital inclusion. The online engagement has been recognised as determining the meaningful use of ICT, and the capability to effectively use of ICT has become an important element for digital inclusion. In 2015, a new Australian Digital Inclusion Index (ADII)¹⁵ was launched, which clearly shows that society has gone beyond

¹⁵ The ADII has been created to measure the level of digital inclusion across the Australian population, and to monitor this level over time. The Index, powered by Roy Morgan Research, has been created through a collaborative partnership between Swinburne University of Technology, Telstra, and the Centre for Social Impact Swinburne. The 2016 ADII report is available on <https://digitalinclusionindex.org.au/wp-content/uploads/2016/08/Australian-Digital-Inclusion-Index-2016.pdf>.

understanding the digital divide as a technology access disparity among the population. However, there is still limited understanding of those who remain offline, even despite the increasing risk of social exclusion, as almost all sectors of society have rapidly moved towards online practices. While successful cases of ICT adoption are extensively reported in policy documents, the voices of those who are digitally excluded are largely missing.

Chapter 5 Qualitative study results

For the last decade, the Australian government has put into practice national broadband policies to promote ICT deployment and adoption. As observed in the review of policy documents, the government has sought to complement supply-side policies that focus on building infrastructure with demand-side efforts that seek to drive demand for broadband access and services. Infrastructure provision aimed at increasing access across Australia has been prioritised in policy interventions throughout the policies' operations. Demand-side interventions are well recognised to be important for achieving policy goals but have not been much embedded in practice. In particular, there has been limited understanding of local needs, which may have prevented the addressing of deep-rooted digital divide beyond the access perspective.

The desired impact of ICT is the conditioning variable of any useful working definition of the digital divide, and different ends justify different definitions. Therefore, the effectiveness of national policies in bridging the digital divide begins with identifying why this was the case and what we can do to address it. Digital divide policies have been heavily focused on supply-targets, with little empirical evidence on how and why people use or do not use the available technologies. An evidence-based approach by learning the digitally excluded groups is crucial to effective policy development to tackle the persistence digital divide.

The purpose of the qualitative phase of the research was to explore and illuminate the underlying circumstances of non- and limited users and their resulting experiences of exclusion in everyday life. Ultimately, the goal of the study was to provide evidence to develop a user-centric digital inclusion practice.

This chapter discusses the findings of this study. In the first section, reasons for non- and limited use include latent circumstances surrounding non-use and the underlying circumstances of limited users. Following this, the resulting everyday experiences of exclusion derived from (1) socialising (connectedness), (2) engaging in information flow, (3) access to public and social services, (4) parenting (education) that emerged from the interview data are presented. In the following section, a theoretical theme, "digital exclusion and relative deprivation", that emerged from data analysis is discussed, followed by discussion of the theme "social encouragement and support".

5.1. Reasons of non- and limited uses

5.1.1. Latent circumstances surrounding non-uses

The reasons for not using the internet are multifaceted and intertwined and, further, may not be explicitly captured by simply examining the statements of non-users. Therefore it was crucial for me to listen to personal experiences with the internet in the interviewees' day to day lives, and be open to any clues as to the underlying reasons for non-use. The reasons for not using the internet were initially fragmented and unclear. Underlying reasons were later revealed during the course of the interviews as conversations about the interviewees' stories of internet and computer use deepened.

5.1.1.1. Learning from non-users: The meaning of 'no need'

Proxy users, shared uses

When asked about non-use, some people indicated they do not need the internet or are not interested in internet use. As such some of the non-user interviewees initially gave obscure responses, such as 'no need' and 'no specific reason'. Jane, a full-time housewife, and Catherine, a retired teacher, are both in their 70s and have no experience with the internet:

I don't know, there is no particular reason. It's just something I have never got around to (Jane, a non-user/70s/female).

I just don't need to use it (Catherine, a non-user/70s/female).

Jane, who had never used a computer, initially seemed not to know why she had never got around to using the internet. Then, during the interview, Jane talked about her family members using the internet for booking a show ticket. It became obvious that her daughter was actually serving as a proxy user for her, which may have contributed to her continued disengagement. However, Jane also implied a growing need to use the internet herself:

If we want to, we go for shows in Sydney quite often, my daughter and daughter-in-law go with me, and they sort of do all the bookings over the internet, of course, they do it for me. But I honestly think I really should do it myself, because nearly everything is over the internet now. You have got to have an email address for... near everything nowadays, haven't you?

Considering her personal background, in which she was a full-time housewife throughout her life and had never been employed, it is unsurprising that Jane has not had the inclination to use the computer and internet for most of her life. However, Jane has started to perceive the

necessity of learning to use the internet due to an increasing number of sporadic experiences and events in her daily life where she relied on family members. Her frequent observations of family members and friends using the internet on her behalf led her to the conclusion that “*it is time that I sort of got myself motivated and did something about it*”.

Similar to Jane, Catherine initially expressed that she did not have any need for the internet. Then, later in the interview, she talked about her friends who helped her complete online forms relating to a car accident, and economic constraints emerged as an issue involved in her non-use:

I was glad I was able to do that thanks to the friend, but I don't think it's enough motivation for me to get a computer. I mean if you only get it to use that often, what's the point of paying the internet fee, because I am on a pension. I have been on a pension since 1981. I live poorly in the sense of I don't buy what I don't need.

For non-users, the high cost of internet service may not be a priority over other items, unless they are strongly motivated to use the internet. However, as social services and products are increasingly provided online, the frequency of needing to go online to get something done has increased. Accordingly, the ‘no need’ reason for internet non-use may no longer be relevant.

Rachel, a full-time housewife with four children, first mentioned unfamiliarity with technology as a reason for her non-use.

I don't use it because I wasn't educated with the internet and I just can't sort of get my head around it, even the phone is difficult for me.
(Rachel, a non-user/40s/female).

She believed that no experience of learning the internet and computer at school meant she had lacked opportunities to become proficient, resulting in her eventual non-engagement in technology. Rachel's quote, on the one hand, implies how internet use can be perceived as difficult for some people.

Contextual circumstances surrounding her non-use emerged while she was talking about her husband's use of the home computer and eldest son's smart phone use:

My husband does have a lot of different hobbies, so he generally looks up places online to get things delivered, and he always looks up different websites related to whatever hobby he is into to find information about the hobbies and any related devices. He uses it for that and pretty much spends a few hours on the internet a day. And, my son [20s, a university student], he sits in the lounge room and uses the internet on his smart phone for a few hours a day.

Looking deeper into her case, it also became apparent that she did not have a personal computer to use, with only one desktop computer at home. A central reason for her non-use turned out to involve her fear that she might ruin the desktop, leaving her husband unable to use it:

I see when his computer gets a virus or something it's sort of disappointing for him and I think to myself, if I was to get on there, I probably would put a virus on the computer. Every time he fixes it, it takes many hours; I am scared of disconnecting him.

Within households where computers are shared, the household structure and placement of the home computer may lead to limited use by some family members. Computers are traditionally a device shared among household members, such that proxy/shared use can be explained. As a result, families often prioritise use among members. In Rachel's case, it was clear that 'household' ownership of technology did not always extend to 'personal' use for all family members. She had limited opportunity in the household as a result of sharing devices with skilled family members (husband and children). Priority might be determined according to relative necessity of using the internet or computer for education and work-related tasks.

Ownership of relevant devices is necessary for use of the internet because it is an access point that is increasingly individualised. Despite the access gap being recognised as decreasing given society's increasing connectedness, the matter of access is far from simple, at least among the interviewees who participated in this study. Instead, it is affected by many circumstances and can be compounded by changes in an individual's life, such as in place of abode. For example, by moving to a retirement village, Amanda, who once used the internet, stopped using the computer and the internet.

Interviewer: Why did you stop using the internet?

Amanda: I feel.... I didn't get a personal laptop here... but I used to have one, I used to use it a lot. Once I came here [retirement village] I didn't have flexible access, a [public] computer is around the corner. Once I came here I stopped using computer.

(Amanda, a lapsed user, 60s/female)

Further personal reasons revealed the underlying circumstances of her non-use: a changed lifestyle and perceived difficulties in setting up her internet use again.

Amanda: I'm getting old now and different lifestyles, I can't be bothered...

Amanda: It gets boring sometimes, I might be able to get in contact with my brother, send an email... but I will have to learn and reregister, get new email addresses and pin numbers....

Along with her change in lifestyle, the constraints she perceived in restarting use of the internet, and her dependence on asking for help to go through the necessary processes online, made her remain offline after moving to the retirement village. Digital literacy and social support subsequently emerged as further reasons for non-use.

Too difficult, too complex

One of the non-user interviewees had a very clear reason for not using the internet. Scarlet, who was a non-user of the internet but owned a smartphone with mobile 3G network, was very keen to learn how to use the internet, especially email and Facebook. For her, an absence of instruction on how to use computers or the internet was the main reason for non-use.

We don't use the internet because we don't have enough instructions or we don't know where to go to get the instructions. I think nearly all of the people in this neighbourhood, which is such a small percentage of the whole population, well I am the oldest, haven't had access to instruction. That's why we don't use it (Scarlet, a non-user/80s/female)

A similar case was observed during an interview with Anna, whose husband was a novice learner. While discussing her husband's course, she raised the issue of a lack of instruction received by her friend, who was keen to learn but ended up giving up and remaining offline.

A friend just said she's going to some classes but she gave up because she just couldn't figure it out and other classes just didn't suit. She had no experience whatsoever, no one helped her and she didn't have a computer at home, so, you know, all this made it hard for her. She just couldn't comprehend it (Anna, a regular, narrow user/60s/female)

A lack of instruction and support is perhaps more relevant in the case of elderly people living alone at home, like Scarlet and Anna's friend, as it may not be easy for them to have access to helpers such as family members. As such, external resources, such as public centres and service providers, can be a major resource when it comes to asking for help with devices and the internet. However, in the case of Anna's friend, it was not helpful for her to attempt to learn how to use the internet and computer, which shows that a lack of instruction, limited device ownership and internet access, and a lack of informal support networks contributed to her dropping out of the computer course.

Throughout the interview, Scarlet also strongly complained about the insufficient support and instruction given by service providers when recounting several experiences of reporting problems with her mobile phone to enquiry service providers. She expressed her

disappointment and discouragement, saying “*I was knocked back three times. Bad knock-backs with Telstra*”

However, when she explained the specific problems with her mobile phones, it was revealed that Scarlet lacked understanding of different communication networks in general.

Occasionally you will get somebody to help you fix problems from the shop.
That’s good, but no one could fix it because it’s obviously a difficult problem.
But, they didn’t even try they just said “Oh, Gmail account, we can’t do it”.
That was their story; they just didn’t even try.

Her account of her problems with Gmail on her mobile phone indicate that she understood the issue to be the responsibility of Telstra, a service provider, not recognising that Telstra in fact cannot solve Gmail issues. This clearly shows how it would be difficult for those who lack knowledge of ICTs in general to find the right customer service points for their problems and access sufficient support. This implies why, in spite of several attempts to solve her mobile phone problem by asking the service provider, she was not able to receive sufficient support.

What is notable here is the matter of support and instruction with ICTs, which pertains to the digital literacy issue. That is, to be able to access such support, digital knowledge/literacy is necessary because understanding what the problem is and where to go to receive the right support and instruction is required. Furthermore, it is incumbent on users to solve problems, making it more challenging for those who are not familiar with the complex structures of ICT service providers, including internet service providers, email service providers, and mobile phone carriers. In particular, for those who have limited informal assistance available, asking for technical assistance from ICT service providers and public supporter centres, such as local libraries, may be very challenging.

5.1.1.2. Insights from novice users

This study not only includes non-users but also those who started using the internet recently, a so-called novice user. The contextual reasons for extended non-engagement among novice users were captured in the course of interviews.

Louise, who started using the internet a year ago and was learning to use a computer and the internet through a training program at a local library, explained her previous non-use of the internet:

I was a full-time mum, not working, so I did not have exposure to technology. I was always busy with other things and just wasn't paying attention
(Louise, a novice user /50s/female)

She did not have spare time when she was a full-time mum, which is why she did not use the internet, despite having the necessary resources, such as computer devices and home internet access. However, when she explained further, it became clear that an underlying reason for her non-use involved limited opportunity to use the computer in the household and sharing devices with family members.

Now I have my own laptop and can use it anytime. My son bought a new one and he gave me this one. Then I started using the computer more often.

As in the case of Rachel, whose household had a desktop mainly used by her husband and eldest son, it would seem that skilled members are prioritised in the use of digital media if there is a limited number of devices available in a household.

Another contextual reason for non-use was captured in the interview with Parker, who started using the internet eight months prior to the interview and was also learning to use a computer and the internet through a local library and Telstra Digital Training Centre. From his responses, his underlying circumstance of extended non-use emerged.

Interviewer: You told me that you retired from being a public servant two years ago. I was wondering if you used a computer when you worked.

Parker: I was actually operating machinery. When I was employed in a government job, operating machines, we were outdoors. The ones in the office, they all had computer training, but not us, I didn't have training before, that's why...but I knew when I left that I'm going to have time on my hands for using the internet. So I'm learning myself now.

A similar case was observed in another interview with a retired builder. Samuel, a novice user, mentioned:

I worked in the building trade; you don't need it [the internet]. You didn't need it then. (Samuel, a novice user/60s/male)

In contrast to these two interviewees, Anna, Samuel's wife and a retired public servant, mentioned that she learned computer and internet skills from work.

Interviewer: Did you take a computer course together with your husband?

Anna: No, because I had already done all the courses in the public service when I worked before.

She additionally commented on her experience of internet use at work contrasting her husband's non-use as below;

Well, I think mainly because I worked in the public service for 30 something years, so I was forced way back to start learning, whereas my husband was very busy in the building trade and didn't have any requirement for it, and now he has the time to sit down and do it. When he retired he had more time to do it. (Anna, a regular, narrow user/60s/female)

By observing a similar experience to Anna's case in another interview with a retired administrative assistant, this observation was strengthened.

I retired in 2003. When I used to work, we had basic sort of lessons of computer, because we got clients come into appointments, we had to put the name in the computer. (Emily, a regular, narrow user/70s/female)

As observed in some interviews, the obtaining of basic skills and understanding technology at work significantly reduced a sense of unfamiliarity with technology and negative feelings surrounding technology, such as fear and concern related to internet use, which were often observed in the interviews with non-users and novice users.

The biggest problem was when I started, I tried... I was afraid to push buttons in case I wrecked something. (Samuel, a novice user/60s/male)

Along with the reason for continuing non-use, underlying circumstances contributing to limited or partial use surfaced during interviews with users.

5.1.2. Underlying circumstances surrounding limited uses

There were wide variations in use of the internet among user interviewees, ranging from those who use the internet occasionally, or for only limited functions, such as emailing or playing games, to those who use the internet frequently and regularly, but only through smartphone (a lack of home internet access).

5.1.2.1. Understanding limited users: "I use the internet once a day"

It was often observed that interviewees described their frequency of internet use as "once a day" at the beginning of interviews. The meaning of this expression became clear when they added additional accounts of what they did everyday with their laptop/desktop. Also, it turned out that some users accessed to the internet more than once a day.

Probably about once a day in my home, I turn the computer on. Once every morning, sometimes once in the evening, I turn it on, not to do anything, but to see if any messages [emails] have come in, and usually, there is one, sometimes there is a lot of information coming in.

(Jackson, a regular, narrow user/80s/male)

I use...online banking, emails... After closing my outlook, I usually look at the news on MSN, the website. In the evening, I read what's happening in the news online. (Louise, a novice user/50s/female)

Once a day, for about an hour, I go on email and do information searching.

(Parker, a novice user /60s/male)

Checking emails appeared to be a ritual activity among those who used the internet almost every day, as well as a significant factor motivating them to regularly use the internet, especially in the case of Emily.

Emily: I usually go on spending nearly half an hour playing chess and checking my email.... I am sending emails to a friend in Canada. I keep in touch with her by email.... We catch up...

Interviewer: You mainly use your computer for emailing...?

Emily: Yes, that's what I have this computer for.

(Emily, a regular, narrow user/70s/female)

In spite of daily use of the internet in their lives, it was evident that the interviewees used the internet and computers for a narrow range of purposes. In the initial stage of interviews, they seemed not to have any need to use the internet other than for the activities they usually completed, including emailing, information searching and other activities, such as online banking. However, in the course of the interviews, it was observed that they wanted to make use of the internet and computers in a better way, with many expressing desire to extend their use of the internet. For example, Louise, a novice user, stated:

My wish is to spend more time with my laptop; I have a few books about the internet for seniors, there are still a lot of things to learn. Keep, keep learning!

As a result of not being able to extend their internet use, some interviewees discounted their use of the internet.

I tend to use the computer a fair bit but nothing constructive. A few games I tend to play... and I check emails. (Lily, a regular, narrow user/60s/female)

Several other underlying circumstances which contribute to limited or partial use among narrow users were observed.

5.1.2.2. Concern about online security and capability

Online security was a common concern among limited users. This issue significantly contributed to limited online activities, especially when it came to online transactions, such as shopping and banking. The interviewees below used the internet for emails, information searching and social networking sites, such as Facebook; yet, they never used the internet for finance related tasks.

I don't do online shopping and online banking because I am not quite sure about it. (Parker, a novice user/60s/male)

I don't go onto eBay or any of those online marketplaces... and if I went to buy things, I wouldn't buy things because I don't know that I would trust anything. I buy things out of catalogues over the phone and give my bank details, probably there I feel safer than having them put on the internet where I think anyone can have them.

(Emily, a regular, narrow user/70s/female)

I do not trust its security. I don't believe in the internet, therefore, I do nothing on the internet, nothing on that computer which would allow somebody to access my financial information. I do not do internet banking, I prefer to go and use my checkbook or my credit card, I put nothing financial online.

(Jackson, a regular, narrow user/80s/male)

Jackson's statement suggests he does not recognise that the bank manages his account electronically and that there are also security risks associated with credit card use. Jackson feared "smart people" would take advantage of his personal information, such as using it to advertise products to him. He seemed to have some prior knowledge of information systems, which led him to be more cautious about online security. He perceived that online transactions were not secure because personal information could be used for other purposes. An underlying concern with online security issues emerged when I asked if he would like to learn more about online security.

Jackson: No, because that would be a high degree of knowledge which I could never gain. I might be able to fly an airplane, but I can't fly a computer because I don't have basic skills to operate these new systems with that machine... and because I am old-fashioned and don't trust my abilities to be able to control my information. So, I still provide my tax accounts to my accountant handwritten, because, I refuse to have anything like that. I am quite serious. I do not trust it.

His strong distrust of the online world related to his perceived computer skill shortage and resulted in low confidence when it came to engaging in online transactions. It seemed that he limited his online activities to rather simple tasks such as email and information searching as a

result of privacy and security concerns, resulting in his continuing disengagement with financial activities.

Likewise, Emily experienced difficulty in using security tools, such as a security program embedded into her desktop, which resulted in her non-engagement in financial transaction activities online.

Sometimes with the security thing, it's AVG [an antivirus software], they put up these little windows. I don't know what it is. I have to keep pressing something, a safety thing, and I had something else attached to this, I think I have to pay for that. I cancelled that but I am not sure if they cancel the whole thing. I can't really work out what they mean by half the things they say.

Near the end of the interview, Emily expressed her desire to learn how to do online banking, which showed that she was aware of the benefits of using such services, including its efficiency and convenience.

I want to learn banking, because they are sending out statements very often these days. It might be nice to get statements and to be able to have a look what's coming in.

Furthermore, concerns about security issues resulted in restricted engagement in other online activities, particularly in social networking services such as Facebook, among limited users. While increasing numbers of people are using such online communication services, interviewees like Emily and Lily did not have an intention to start doing so because of perceived security issues surrounding shared content on such websites.

Emily: They put their photos of their baby, parents, family on Facebook. But I don't think it's really safe.

Lily: I think too much gets revealed... that shouldn't even be put up on those sorts of sites. My daughter in law, some of the things she used to put up...those photos that you're putting up, people hijack them and use them for other things. So, they say just to be very careful what you're putting up.

Concerns relating to security, however, are closely related to perceived skills shortages in handling and managing information and content via such online services. This was reflected in Parkers' desire to learn more about how to manage his page on Facebook.

I want to learn something more about the functions on Facebook. There are so many women on my Facebook, I don't want it. All from different countries... I don't know who they are. I just feel it is a little embarrassing, I want to delete them.

5.1.2.3. Concern about limited technical skills

Although user interviewees had basic computer skills and the ability to use the internet and computer, they often faced difficulties doing so.

Louise: My friends can send me the attachments and they know how to put in pictures from the camera, how to use USBs, I still don't know. I'm just watching other people using it. And it's easy for them.

Emily: I am not hooked up to the printer. I think there's one in there. I would never have a clue how to hook it up, I don't know if I would like to know how to, I wouldn't sort of print something anyway.

Such perceived and experienced difficulties in using the internet and computer are considerable barriers to extending usage. Notably, limited use eventually became a barrier to extending skills, unlike for competent users. In other words, limited users are more likely to find such obstacles more significant for themselves than competent users, resulting in their hesitation to try different activities online, which in turn may lead them to not make use of the internet.

The support issue emerged once again. Jackson recently purchased a new computer installed with Window 8. His statements below show how difficult it can be for less skilled users to use the internet and computers and adopt new systems and applications without assistance.

Jackson: It was impossible for me to open up and start my new HP computer. Without assistance I couldn't have done it. It would be like flying an airplane without the instruction. I couldn't do it, I very fortunately have family who can come and help me, and I have a friend who is actually an international computer troubleshooter. You can't buy machines without somebody to set you up... so if you buy in the store, when you come home, forget it, you throw it away, it's no good to you.

Jackson: Shall I say that I have lately avoided that but I couldn't...HP wants me to sign up so they give updates all the time, Microsoft wants me to get updates all the time. The average person can't successfully set himself up, I think.

He observed others' difficulties with technology, especially older members of the community.

They can do what they want to do but they are not sure. And also, my friend, he thinks people, particularly my group, actually start blaming the machine; they just get on a new one to get rid of problems they can't overcome. Because commercially they keep saying new and better. And again, I found that I can use an old machine much better than a new machine if the other new machine

does have everything in its system. I actually feel more comfortable going back to my machine.

The rapid development of digital devices and software requires continuing upgrade and replacement, which can be challenging for those who are not familiar with such technology. In particular, the elderly users may feel more difficult to adapt for a new interface and software embedded, along with perceived technical skill and knowledge shortages. Literacy challenges with software and applications development are directly related to a limiting in application use, thereby causing negative perceptions. It seemed that he was very exhausted by the technical issues he constantly encountered, which compounded his lack of confidence. Nevertheless, he did not want to be left behind, instead hoping to learn more about the internet and computers to keep up with an increasing amount of information and resources being available online only and different ways to access to them.

That is why I have to learn different systems to get the information I want and I have determined to do it, but I am weakening... I would like to learn something that help me communicate and get information. It is trying. Something is wrong with me. I have wasted more time on this machine.

It is worth noting that these interviewees had basic computer skills and the capability to use the internet and computer; however, in order to make better use of the internet, they may need more sophisticated skills. The applications and services enabled by ICT are increasingly evolving, so require different capabilities, tools, skills and techniques for users to be able to make use of online content and services. The observed non-engagement of limited users in online transactional activities may reflect the gap between users' capabilities and the rapid development of ICT applications and services.

The challenge of keeping up with the rapid development of technologies was reflected in Lily's comments on the reasons for her narrow use of the internet. When I asked her about barriers to learning more about computer and the internet, she initially replied, "getting to the lazy stage to learn", and a short time later, explained further:

If you want to do all these other things, well then you've got to sit down and spend hours learning it and doing it. I said, you know, you've got other things that have to be done. Some people like it, like doing all those complicated things. I like it simple. Just keep it simple.

The interviews with limited users described above indicate that having basic digital literacy is important to use the internet but not sufficient to engage in different online activities. In

particular, knowledge of security and privacy features would appear to comprise an important part of digital literacy, such that it is necessary to educate and inform users accordingly.

5.1.2.4. A lack of awareness and relevance

Along with limited computer skills, it was often observed that most of the limited user interviewees were unsure about how other content and functions might be useful in their lives.

What other things do you use it for? Do you use it to look up all the stuff at uni? What other sorts of things do young people use on the internet? I want to know what other things I would be looking at and should be looking at.
(Anna, a regular, narrow user/60s/female)

A lack of perceived benefits can lead to limited use and, thus, internet use can be deemed as a less important activity, just as Lily described her internet use as being “nothing constructive”. Furthermore, an awareness of benefits relates to the continuing use of computers and the internet for some limited users. When I asked about barriers to extending use of the internet, Louise expressed concern about her limited use. Although she was a keen learner with strong motivation to continue to learn and use the computer and internet, she felt that she would be less motivated if she did not need to use the internet to communicate with her children studying in Sydney. She seemed to be worried about losing motivation as a result of no longer having a meaningful need to use the internet.

If I didn't have them in Sydney, I would not be using it very often. I think only just for pleasure, reading something, finding some information.

For Louise, communication through the internet was very meaningful, particularly with her children. Using the internet to communicate with her children was valuable because it enabled her to continue her role as a mother through routine chats via Skype.

Louise: If I am not able to use Skype or email, there will only be phone. It's limited, because if you call another state, it's limited how long you can talk, but by email, you can send emails, Skype in the evening... Skype is wonderful and you can see each other, and talk for one or two hours. We feel very close and in touch, especially, you know, with the people you love, it can be wife, mother and daughter, it's important, because you connect to them, talk more often. Sometimes she can tell me what she cooks, something not big, but you know this is how you share information with each other and advice, so they keep in touch....

Louise: Children still remember. Their mother and father, they are the people to contact... If I need some advice, I can ask and they are available 24 hours if there is some emergency.

However, as mentioned above, she suggested her need to use the internet could decrease unless she extended her skills and broadened the meaningful uses of the internet and computer in her life. In other words, she needed to associate the internet with efficient and effective use.

It became clear the significance associated with internet use plays a key role in ensuring limited users are continually motivated to be involved in online activities, especially in the case of novice users. The benefits of internet use should be directly associated with the value it adds to their lives because, this way, the relevance of the internet can increase. In this sense, a lack of awareness of the internet's value among limited users is related to a lack of relevant content and service.

The interviews with the limited users described above indicate that having access and possessing devices does not guarantee ongoing use of the internet. Rather, the underlying circumstances of not being able to extend use relates to their ability to engage in different online activities, as well as their awareness of the value and meaningfulness attributed to internet use.

On the other hand, for some users interviewed in this study, in spite of possessing both capabilities and a sense of the internet's meaningfulness, limited access and devices result in limited use of the internet.

5.1.2.5. Data limits: cost concerns and service limits

The way in which users access the internet contributes to limited or partial use, resulting, for example, from restricted data packages. Layla accessed the internet through her smartphone and iPad, using a limited data plan (monthly \$85 for 3 GB), as she did not have a landline through which she can access home internet. She used the internet regularly for information searching and Facebook. Her three children also used devices for playing games and accessing education programs (puzzles or number games). There were limited options in the data plan provided by her service provider and thus, she was not able to consider an alternative way to connect to the internet at home. This indicates the need for literacy around service providers and available plans. However, growing demand for the internet among her

children caused her to be more cautious about data usage, resulting in her using the internet in a more limited way.

I am actually in the process at the moment of trying to find a mobile service with enough GB, but I haven't found one that offers more than 10GB yet. That's a reason I don't use the internet more, because I don't have much data. (Layla, a user only through a smartphone/30s/female)

Additionally, when she mentioned her career plans, Layla expressed further concern over internet data, which would hinder her from developing her career and her children from learning online unless a better internet service, like the NBN, was provided in her suburb, as she hoped it would be.

I'd love to have home internet but I can't use the landline I have got because it's absolutely too slow. In the near future, if I can find network data that works for me, then probably I will invest in it because my kids are going to need it to do homework and I need to study again, so my internet use is going to increase... I want to study again and get some more qualifications and actually I'm thinking about a whole career change so that would be a lot more study... I want do some at home... But apart from that, my daughter has homework every week, so she needs to use the internet.

The access barrier Layla encountered shows the irony of being located in one of Australia's most connected areas yet unable to access the internet. Being a full-time mother, she sought at-home study options via online courses as they were one of the most efficient ways to provide her flexibility in learning. However, Layla recognised that her limited data allowance would be a significant barrier to her study.

When I raised the question, "If you run out of your monthly data allowance, what do you do?" she replied:

The only chance I get to use the internet is with my sister who works full time and she lives 20 minutes away. So, I could call her if I had to. If I absolutely had to, I can go over there after school but I have a school routine in place in which the kids have to be in bed early... to go over there is a visit to start with, then to use the internet, then pack the kids up to come home, and they get to bed too late... I don't go anywhere weeknights, so I usually go on weekends if I have to.

Near the end of the interview, Layla articulated the importance of internet use in her life as follows: "Honestly I can't live without the internet. So...it's almost as important as having a car to get the kids around, things like that." Given her strong need to use the internet, her limited data resources may hinder herself and her children from making use of the internet in many ways.

The priority issue of the household ownership of technology emerged once again. A full-time mother is probably the family member least likely to have priority in the use of digital media because of the relative necessity of using it for education, resulting in more children being prioritised in home internet use. Along with a limited number of devices in a household, data usage limits can also cause some family members to have restricted engagement with digital media.

It became clear that limited data packages can be a critical constraint on extending use of the internet for some people. Jackson used a pre-paid mobile broadband plan to access the internet. He remarked on his limited access to the internet.

I have a little thing [a USB dongle] there, which I pay \$140 a year for, which gives me 10GB. I have never used more than 3 or 4GB per year, which tells you exactly how much I use it, less than 5GB per year.

Given his low data usage, he could be classified as a light user. Although it seemed that Jackson did not need to extend his data, when I raised a question on changes in his internet use, his increasing need for the internet was captured.

My usage has certainly increased because I realise to get any information, I need to go to the web. Before I had internet access, I would ring up the company or the government organisation and request them to send me information or I would go to the library and do research, but this is no longer as quick as getting... in fact, many places won't send you a hard copy what I used to call information.

Jackson sensed that inevitably increasing internet use was due to social changes in access to information, which is indeed a crucial part of online engagement in order to be able to retain their social engagement as a citizen in a society. However, given his limited data access with the dongle plan, he may also face an access constraint when it comes to accessing information online, as information has become increasingly "online exclusive" nowadays.

It is notable that the two interviewees above used the internet through limited 3G data and mobile broadband data services. The access limitations did not appear to act as a main barrier to extending the internet use of other limited users who have home access, such as ADSL through a telephone line. However, regardless of the extent of their internet use, it seems that access to relatively less data is a critical constraint for some limited users, in particular, those who have family members using the internet.

5.1.2.6. Quality of access

Internet connections matter for limited users, not only in terms of data as described above, but also in relation to the quality of the connection, such as speed. Low internet speed and resulting limited use were observed in the cases of several interviewees.

For Lily, a limited user, a slow internet connection directly affected her use at home and decreased it in many ways.

Lily: Well, let's just say it's probably less now because of the difficulty with the computer at home getting onto the internet. And then when you finally get a page open and then it takes so long to get them. Very slow...it takes forever to do anything. So, something needs adjusting, you know.

Lily: Sometimes I think oh, I'd like to look at that but then I say certainly don't do it here... I can't at home because of the problem with the computer.

Similarly, I observed Parker, a novice user, also had a problem with connection speed when I interviewed him. When he wanted to show me his Facebook page during the interview, I noticed his internet connection via mobile broadband data was very slow and experienced frequent disconnections, which meant it took him a long time to open websites or play videos, making it very exhausting for him to use the internet at times.

It is notable that both the interviewees above had decided to leave the connection matter unsettled, despite it causing them much inconvenience when using the internet, because they did not know what the problem was and could only look on despairingly.

Having internet access at home does not necessarily mean being always connected, an insight strengthened by Peter's experience with his internet connection, satellite and mobile networks. He resided in a regional community located 40 minutes north of the centre of Canberra where satellite service and mobile networks only are available due to the coverage limit of a fixed connection. Here, the reliability of an internet connection, as well as speed, mattered.

My wife tries to do a lot of work from home. And on a bad day it's just not possible. No reception. (Peter, a regular user/40s/male)

Not having a reliable internet connection at home is a barrier for some internet users, especially those who work from home. Peter's wife and Lily experienced difficulties working from home due to intermittent disconnections and the slow speed of the internet. Unreliability

and slow connection speeds directly affected their ability to work in more efficient and effective ways.

5.1.2.7. Storage capacity and device capacity

Another circumstance of limited use involving the storage capacity of mobile devices. Jenny, a mother of four children and full-time university student, raised the issue of an insufficient storage capacity on her iPhone, which was being used by her young children as well.

I've got an iPhone 5S and I'm due for an upgrade soon, and I will upgrade purely because my iPhone 5S is only 16 gigs, so if the kids want to play a game for instance, right, I don't have any room on my phone. I've got my uni stuff that is kind of a priority now. So, I've got the uni apps, email apps and stuff like that. That's a priority because I've only got 16 gigs, and apparently, the latest updates for the iPhone is worth 10 gigs. When I do upgrade my next phone, I'm going to make sure it's got a huge amount of gig storage on it...

After installing apps for her children onto her smartphone, constraints on her own use emerged, such as relating to her use of university apps and other entertainment apps.

Interviewer: If you use that one for just studying, you don't need more data?
Jenny: If I just have this 16 gig, it is purely just to make phone calls, send text messages, search the internet, and download the apps for uni. I wouldn't need anything else but purely because I've got little kids and you know how convenient it is to be in a supermarket, and doing grocery shopping and have a 2 or 3-year-old watching Peppa Pig. Watching Peppa Pig, they are being occupied. They are not annoying you, they are not saying, "Mum, can we have this?" I'd rather they sat there in the supermarket and watched my device, while I walk through and do my shopping than annoy me while I do my shopping... I don't have any room and I have had to go without any music on my device.

Jenny's experience of constraints on her internet use as a result of sharing her smartphone with her children relates to the matter of "household" ownership of technology, which is an underlying reason of non-engagement for some non-users, especially full-time mothers.

Jenny's advice to consider "who is using it" when purchasing devices clearly shows another underlying circumstance of limited use.

It's a little bit more expensive. They range from say 500 to 800 for example and they go, ah, we are just going to buy the 500 one. You know what? Once you do all your updates, you don't have room for anything, so you are better spending that bit of extra money getting more storage on the device, because depending on who is using it, you need that.

5.2. The impact of non- and limited uses: exclusion in everyday lives

From the interview data, it was evident that non-engagement impacted participants' everyday lives in many ways, regardless of their level of technological use or non-use. This included exclusion from different services and facilities, inability to undertake community participation, inefficiency of daily tasks, and also prevented further understanding of the potential value of technology in their lives.

Interviewees' comments surrounding opportunity deprivation through digital exclusion fell within four categories: (1) socialising (connectedness), (2) engaging in information flow, (3) access to public and social services, (4) parenting (education).

5.2.1. Exclusion from socialising (connectedness): staying connected

The internet can help people communicate in many ways. In particular, emailing was recognised as a pathway to social networking:

I socialise with a lot of mums. They organise social events and they say, 'What's your web address?' I say, 'I don't have one,' and I give my husband's to them. But even though he does use the computer a lot, he actually doesn't go on to look at things sent to him that often... (Rachel, a non-user/40s/female)

There are kindy [kindergarten] mums and dads getting together, I think once a month or something, to go out to have dinner and just get away from kid's things, socialising. The way they let us know is email... (Layla, a user only through a smartphone/30s/female)

Email is a way to keep in touch with distant family members and friends; it is valuable to users in giving them a sense of connection to others. This was perceived among lapsed users:

I used to use it [email] for keeping in touch with my brother and sister in Australia when I was overseas... Now I can ring them. Most live in Canberra except for my older brother. I manage well without the internet. I manage well with the telephone so I don't really need it... But, it gets boring sometimes without the internet, otherwise I might be able to get in contact with my brother up in Grafton, might be able to send an email.... (Amanda, a lapsed user/60s/female)

Amanda's comments indicated that she sometimes missed communicating with people by email:

Amanda: It seems that phone makes it easier to deal with urgent things. But sometimes I can't get through on the phone. The phone is quicker than anything. But if you can't get in touch, you can send them a message and they

will see it because most people, they check it every day.

Interviewer: Would you like to use the internet again?

Amanda: Sometimes I want to use the internet, not having it is why I've lost all the contacts of my sisters in Sydney and around.

Anna, who briefly became a lapsed user after retiring, also spoke of the benefits of email in allowing her to stay in touch with people.

I think that, it's good, you know, I am concerned I would miss it... Without it, you miss out on keeping in contact so much. I think you do tend to ring people more on the phone when you haven't got it, because you have got a contact, that's the way you get in touch with others. Once you get internet, your phone becomes less important, and that's the way you keep in touch with most people, actually you have got to have an email.

(Anna, a regular, narrow user/60s/female)

William also mentioned how communication could be inconvenient without email.

Email is much easier for communication, and useful for keeping in contact with people, you couldn't do without it. It's something hard. Well, I have got an acquaintance in Sydney, she doesn't have a computer, it is quite a different thing; you can't get the same amount of information through. Communication is much slower... (William, a regular user, mobile phone non-user/50s/male)

Similarly, by not engaging in online communication such as emailing and Facebook, Jane found that she was being excluded from family networks

You do miss a lot. You get all the little messages and photos but with them [grandchildren], everything has happened, they email one another, you know, I do think I'm missing out a bit there. (Jane, a non-user/70s/female)

Her need for online communication was often observed in the interview with her.

Jane: All my family, they all have the internet, Facebook, laptop...
(.....)

Interviewer: If you were to learn, what would you like to learn?

Jane: Well, they tell me you can shop often online, all that sort of thing. I don't know, I would like to do that, I don't know what I would really like to do with that actually, maybe keeping in contact mainly. I would use emails, Facebook possibly, I think I would have to do that [Facebook].

Staying connected is a central reason why some interviewees retained their home internet access and computer, even despite their sporadic internet use.

I am 80 years-old and live with my wife in Canberra. I am retired and am happy about still being alive. Therefore, I enjoy everything I can physically, which isn't very much. One of the things I do have is... plenty of time and I still have a number of old friends. Some of them have been friends since we were 10-11, 12 years old. We are the survivors. We exchange weekly emails,

very short ones, that's a part of being old and looking back and enjoying life.
(Jackson, a regular, narrow user/80s/male)

The following comments from Samuel and Parker, novice users, reflect the changes they have experienced and observed in staying connected with family and friends via their use of the internet:

I can keep in touch with people that are outside this area. Without internet, I don't think I could keep in touch as often. We do it probably every week now. If we didn't have it, we'd probably do it every 6 months.
(Samuel, a novice user/60s/male).

I lost my wife. I am a widower. My wife has a sister in Queensland, she's got another sister in Victoria, I can talk to them on Facebook.... My wife had a good friend, she moved to Perth. I can communicate with her occasionally. She's quite good. She often asks me how everything is going, it is nice to have friends asking about you. (Parker, a novice user/60s/male)

Parker additionally mentioned "*It would cost a lot on the telephone to talk to my friends and family.*"

Similar to Samuel and Parker, Clara also mentioned the usefulness of the internet in keeping in touch with family and acquaintances, and giving her a sense of connection with her social networks. Otherwise, she might have felt isolated as a result of living alone away from them.

In the interview with Anna, the meaning of "staying connected" to individuals became clear. She explained why she started re-engaging with the internet and using home access after retiring.

Anna: I didn't have home internet access actually because I thought I could do some other work. But then, I found I missed it when I gave up work, I missed having the computer... having the ability to use it. I needed it here at home because that's only way I can communicate with some people and look up something.

Having some time of internet disconnection caused her to feel excluded when she lost the medium that could connect her to her social networks.

The desire to stay connected was reflected in Layla's personal experience with Facebook when she was going through a difficult time, which shows the importance of staying connected with people online.

It's another way of staying connected with people. A few years ago, I was quite depressed and suicidal so I didn't leave the house anyway but using the internet and Facebook, places like that, I actually felt like still being part of something,

so I was not completely isolated. It was beneficial to me during those tough experiences. (Layla, a user only through a smartphone, 30s/female)

She further explained her personal circumstances as a single mum of three children, demonstrating how internet use can compensate for constraints on socialising.

So considering these boys, I can't go out to the library and things public, so I stay connected to people by using the internet.

By the same token, such a lack of opportunity suggests being excluded from society. Rachel expressed her feeling about non-use of the internet, "*I am not well connected to everyone else, to what's going on...*"

5.2.2. Exclusion from engaging in information flows

5.2.2.1. Information flows

As access to products, services and information is becoming more and more digitalised, there is growing concern that non-use of technology can lead to exclusion from information flows. This involves not only existing information provided by public and private organisations, but also user-generated content.

For example, Scarlet, who was a non-user of the internet, was keen to learn more about medical information. As an amateur dancer, keeping her heart in good shape was very important. However, traditional media, such as TV and magazines, was the only window for her to acquire such information. Therefore, she often felt that she was missing out on well-researched health information from reputable specialists and organisations due to her limited use of the internet.

Scarlet: I am particularly interested in medical problems because I have them myself. I often watch medical TV programs... Doctor Peter who's one of the best medical people that you can listen to, he gives references to the internet... He talks about your problem with diabetes or some problem which relates to you or somebody else. He gives references to the internet, they are pretty reliable references. You can sort of extrapolate on them. There is heaps of information. You get onto interesting subjects and then you want more information...if I had the internet, I could use a lot of references from these shows to do further research.

On the other hand, Clara, a user of the internet, emphasised the benefit of searching for information related to health and medicine by recounting her personal story.

When I was diagnosed with kidney cancer, the first thing I did was go on the internet and research it. To find out what it was, what might happen to me, and what the treatments are or what bits and pieces I need to take..and the same nowadays with medication. If I get prescribed a medication by the doctor, the first thing I do before I take the medication is to go to one of the medical sites that I trust and know that they don't mess around and see what the side effects can be with that medication.

Clara's experiences of being digitally enabled empowered her to manage her health by extending her knowledge of her disease, leading her to be more active in dealing with it rather than entirely relying on her GP.

You get a lot of elderly people on all these medications, and they're taking this and that. And if they had the internet and they went on there and had a look at the side effects of some of the medication that they're taking they might not take it. They might think twice and say to the doctor, well, what's an alternative to taking this medication?

Layla, a mother of three children, articulated how she was making use of the internet for the benefit of her children by searching information online and becoming well-informed about childhood disorders and other medical knowledge.

Layla: My son's been diagnosed with ADHD and ASD so I do a lot of research on it on my phone on the internet to research... books I can get, services I can access to help him, that's about the only reason I do use the internet. (.....) Research things and just googling, googling anything that I may need to know about my children, usually just about children or about family members of mine who have been to the doctor and told something... I'll google it to find out, I try to find out everything I can about everything.

Staying in a flow of always-on information is very important for individuals to remain connected to social groups, communities and societies. Jackson, who was a regular visitor of a digital training program provided by a local library, found the importance of staying in a flow of always-on information was forcing him to keep up with changes to his computer and the internet.

If I read about something in the newspapers, or I hear something in the news is happening, I use my email to go into the relevant webpages. I find I need to do that, because, most people only give you a www address for more information. I should also add, my wife, she doesn't use a computer but she gets me to help if she wants to check something on sale, something happening, or shoes, she gets me to bring up the computer. We do use it for her to look at real estate, buying things, and also programs, if there is a celebration in the park or public activity, or movies coming up. If we didn't have a computer, it would be more difficult to get that information.

Jackson firmly expressed his reason for continuing learning about the internet and computer: not wanting to be left behind.

That's why I have to force myself to use that machine. I have forced myself to use the internet and I don't mind doing it now, because that's the only way I can get the information I want. I certainly don't like being put on the shelf, as we say thrown away, because I can't relate to people.

Louise, a novice learner of the computer and internet, reflected on experiencing change in the way she ends each day and expressed her positive feeling at being able to participate in the latest information flow.

After closing my outlook, I usually look at the news on MSN, the website. In the evening, I read what's happening on the news online... So in this way I can catch up and see what's going on. Then I close my laptop. I am enjoying that.

Samuel, a novice user, also found internet use to be a good way to access resources which were not accessible when he stayed offline.

You have got a try like me. It didn't worry me before but now that I have tried, yes, I am glad I did, because it has given me access to something that I wasn't able to use before.

The way to access information and public resources has been increasingly moving towards the online world, resulting in rapidly decreasing offline access. Clara observed such a change when it came to how local information, which used to be delivered in printed papers, could be accessed, and found the sudden change inconvenient.

You know, now they don't deliver our local rag here so I was annoyed about that.

Those who do not use the internet can be excluded from such information access as a result of its migration online. However, this was not the case for Clara. As a result of being able to use the internet, she found information to be available online and was able to continue to access it.

Clara: And so, I went online and discovered that I could read it online. So, I read it online.

Interviewer: You found an alternative...

Clara: I found an alternative. If they won't deliver it, okay I'm still going to access it.

It is worth mentioning that Clara felt discontinued delivery of her printed local newspaper to be inconvenient but smoothly adapted to the new online form anyway. This was, I believe,

because of the skills she had accumulated using the internet and computer over a long time. She had already become familiar with the e-newsletter, which has increasingly become a way for individuals to receive information and find resources via online subscription systems. However, such changing methods of gaining information are not always adaptable, particularly among those who have never used or are less familiar with the internet and computers.

5.2.2.2. Economic activities

As consumers in markets, non-users are often excluded across whole supply-chains, both in their access to customer service (e.g. inquiries, information seeking or after-sales), or products and services themselves. Due to the efficiency of online management, agencies now tend to reduce their budget for offline management, increasing customer access points online instead. As a result, a significant number of customers who are not connected can be ignored. Here is an example of what digitally excluded customers experience in their daily lives:

I am putting my daughter in speech therapy, and ring up the speech pathologist. She said, 'Can you put all her information online?'
(Rachel, a non-user/40s/female)

Likewise, Jane found that some services were not accessible to non-users of the internet and, as a result, she missed out.

Jane: We went to the beach one day. I got a rewards card, but to activate it you had to have an email address. I don't have one.
Interviewer: Do you think such things happen quite often?
Jane: Definitely! Even when I recharge this mobile, it would get a message just saying you are entitled to an offer... But you have to have the internet to claim it. Go to Optus.com, you know. Not having the internet means missing out on that sort of thing, so I am missing out on it all.

The following comment from Louise shows how those who do not use digital platforms for online banking can be recognised by people around them, as well as how they can be excluded from their social system.

You know now when I am in the bank, the person asks some other people, 'Are you doing online banking?', and the response, 'No' that's strange because at this stage, it's so common. Most people use online banking. You know, soon after I started using it, I found oh my god it's great, because I can see all my transactions. I can check where I spent my money. Still, I pay bills in person, but you know, in the future, there will be no choice; the bills will be only payable online. (Louise, a novice user/50s/female)

Furthermore, inequities experienced by non-users of online banking are also worth mentioning. For example, customers who pay in person are usually charged an additional fee, so are further economically disadvantaged.

Buying products online and benefiting from associated online activities, such as information searching and sharing before and after shopping, increasingly define the way society makes purchases. Rachel, a housewife, found that it could be cheaper and more convenient to use the internet for shopping by observing her husband benefiting from the internet.

Rachel: When my husband buys some stuff, he buys things from overseas, which are a lot cheaper than going to a shop in Australia. For example, in the case of synthetic opal, he buys it from China, and it's like a third of the price compared to buying it in Australia.

Interviewer: What else do you think could be benefits of using the internet?

Rachel: To look up something you need to buy online. I needed a new vacuum so I got my husband to look up different vacuums, things like that ...which was the best one (.....) Plus, to know what you need to buy before you get it, my husband looks up and types a question, the name of things you want to buy.

5.2.2.3. Culture of sharing

Technology enables information to be generated, consumed, modified and updated over time, thus providing a flow of always-on information. Not engaging in such activities as a consumer, provider or prosumer (producer and consumer), may leave an individual outside the information flow and excluded from resources, both related to informative content and to the sense of belonging brought about by digital culture of sharing.

Scarlet: I do feel left behind, because I haven't got this email, and all of our information on what's on in the studio, it's all done by email... The other studio puts heaps of stuff on the internet.

Scarlet: There are some very good programs on dancing on the internet now. See, all of the pictures of dancing in Sydney is on Facebook. It's very relevant. They put it on Facebook and the internet... all of what happened... I'd love to get on Facebook. Everything goes on Facebook now.

Social networking sites, such as Facebook, were often mentioned among non-users as the space where they believed many people around them engage in and enjoy sharing content. By not engaging in such activities, non-users reported feeling excluded from their social groups, such as family and social activity groups.

Scarlet: Many use Facebook, heaps, and see, I have children in America, and Jill [Scarlet's daughter] sends it content on quite often. But for instance, on

Saturday, they put the dancing event photo album on Facebook and the internet. All of what happened, I'd love to go and see it.

Interviewer: Would you like to try Facebook after sorting out this mobile problem?

Scarlet: Yes, absolutely, because everything goes on Facebook now.

Online communication tools such as email and social media have vastly improved the ability of individuals to stay in touch with family and friends, wherever they may be. Through continuing engagement in online communication, users have been increasingly building the digital culture of sharing specific content and their general daily lives, such that online communication has become a way for individuals to share their ideas and feelings with other people. In the first place, not using email and social media might cause some inconvenience; therefore, it seemed that non-users of such online communications tools in this study started recognising their exclusion from cultural opportunity, culture of sharing.

Lily found another form of digital culture sharing among online users. When I asked her, "Have you seen anyone who takes advantage of the internet in any way?" she mentioned her daughter who actively engages in social market online.

Lily: My daughter used to do buying and selling things on there. She was selling or buying baby clothes and selling baby clothes that the kids had grown out of and stuff.

Interviewer: How do you feel about it?

Lily: Well, she seemed to be quite happy with it. But she says it was not always that quick.

Interviewer: Another market actually...

Lily: That's right, another market, another way of getting things done, she said. Also, she does a bit on Facebook. So, she said she tends to find out from other family members that we don't see very often that, you know, or sometimes they might have something that they want to get rid of or swap or exchange.

Participating in economic activities does not merely mean purchasing products and services. In fact, in the digital era, sharing information and knowledge is a crucial part of engaging in economic activities. Acquisition of information and knowledge does not merely mean gaining more options and possibilities to buy and access better products and services. Instead, it implies further extending opportunities for sharing which enable individuals to generate new possibilities for acquiring products and services or further information and resources. However, such opportunities are only available to individuals who are connected and able to share information (e.g. what they have or what they need).

5.2.3. Exclusion from access to public and social services

5.2.3.1. Public and social services

Non- and limited users who are not connected or aware of existing online services feel also ignored by government agencies, whose services are increasingly delivered online.

Layla mentioned *Centrelink*, which delivers a range of government payments and services for Australian citizens.

There is a lot of family assistance. I am on one of them [as a single mum]. Even anything to do with Medicare, or the family assistance office, Centrelink, anything like that, it's all done online.

However, Lily's observations of such changes in the public service system explicitly show that non- and limited users who are not connected or aware of existing online services, are excluded from the public services increasingly delivered online.

Lily: My granddaughter has just had to get a passport for her son who's going to New Zealand for a football match in July. And I said, well, I thought they might all be able to do it through the post office. But you had to get the form online and fill it out.

Lily: They're all going online, like Medicare, you know. You try and line up at the Medicare office, which they've shifted. And then it's over with. Whatever it's called, Centrelink something. And they said do it online. I said well, you know, not everybody's online.

As Lily pointed out above, it is an important point that often those who require *Centrelink* services are unable to afford internet access. Furthermore, Lily additionally mentioned the difficulty of using the online system, expressing a somewhat negative perception of such changes in the public service.

Lily: And when you get online you can't always get it [the Medicare refund]. I had one because I had put a claim in. The doctor had done a couple of biopsies. And they only refunded one of them. And they said, well, you've got to do it online. I said, well, doing it online wasn't any help at all. So, I had to go and get the doctor to print out another bill. But I still had to go over there. I haven't done that. Too much like hard work.

Interviewer: What do you think about such changes in...?

Lily: If they worked efficiently they would be good but they're not. You know, obviously they've got teething problems. But they haven't got enough staff to address such problems.

Interviewer: Adopting such an online system can increase efficiency...

Lily: Well, it's probably saving them money but it's not saving people's tempers.

Parker also perceived such changes in access to public services and started learning how to use the internet and computer as a result.

It's the way to go, certainly the way to go. Everything changing, we're going paperless. I've got insurance with them, they do it in the same way, they go paperless.

He added another example of a paperless public service, the online Census, which had just been introduced at the time of the interview. He expressed his concern about the online Census, as he perceived it would be difficult to complete online.

I feel they expect almost everybody knows automatically. I am surprised by the way they approach it, expecting all people to know the technology.

His additional comments clearly show that an assumption of ICT use is pervasive in today's society, which overlooks the non-user, as well as those who are not able to use the internet, like the limited users interviewed in this study.

Jackson also found difficulty in using the library search system, which has been changed to an online system as a whole.

I have been using the library service but I don't even use the library search system, because I am used to the old card index, and I can't work [the search system], don't understand exactly how to work this.
(Jackson, regular, narrow user/80s/male)

From the above perceived and experienced difficulties described by interviewees, it is anticipated that users who are inexperienced and not skilled at using the internet and computers are unable to take advantage of the convenience of ICT without appropriate support and instruction in how to use online services.

Some interviewees mentioned that there should be an alternative for people who do not have internet access and computers so that they do not miss out on accessing information in their local communities.

The government should have other means so that people who do not have the internet, even if they are the minority, are not left out if there is something going on in their communities.
(William, a regular user, mobile phone non-user/50s/male)

We probably need a letterbox drop of all of Canberra rather than email newsletters or online bulletins, stating where we can get the information, and the instructions, and if you pick up the letter, [it could] say where there are

lessons and how we would go to the ones we need.
(Scarlet, a non-user/80s/female)

Interviewees' experiences of public services provided by government agencies show that digital services directly contribute to decreasing efficiency, as well as highlight the conflict between government demands for efficiency savings and how people react to government changes. Ironically, moving public services online appears to make them less accessible, because the reality that systematic inequities in internet access make such services inaccessible to some is not taken into account. Put simply, the government is contributing to digital exclusion by moving its public services online.

5.2.3.2. Geographic exclusion

In an interview with a resident of a regional community, the access issue was captured. While we were talking about social changes surrounding ICT, the interviewee raised a critical issue faced by himself and his neighbours in completing the online Census.

The Census is coming up and is online. And the way the Census works is we have to complete the Census for everyone who's here that night. So, we've got a small group living in this town with about 40 people and there's no way we're going to be able to do that online. We can't, have enough internet, you know, for 40 people moving through our network at once. So, we do all the paperwork. In my house the biggest frustration is, you know, you want the form to do the Census online. You want to keep track of the government online but we don't have reliable internet to do that.

The issue of poor regional internet access has become more significant with the introduction of public and government services, which have been increasingly integrated into an online system. Peter additionally commented that regional communities have been digitally isolated from e-government benefits.

We're not too far in the country. We're about seven kilometres from a township that's got 1,700 people and growing. And we're 40 minutes from the middle of Australia's capital. And we have no internet. Or we have very little internet. And yet everything is saying go online, go to myGov, do your tax online, do your Census online.

Along with poor access in regional areas, the unreliability of the internet connection was also observed as a critical issue which caused considerable problems for residents, in particular, those who work from home.

My wife tries to do a lot of work from home. And on a bad day it's just not possible. No reception.

Although this study found only one case of limited use relating to the regional access issue, Peter's comments on the issue of poor access and unreliability represent the experience of many relatively neglected regional communities, which are home to working populations and families with school-age children, as well as socially marginalised groups, such as the elderly, retirees or farmers. These social groups likely overlap with each other, and the communities are categorised as belonging to regional areas, resulting in a digitally excluded group and a digital divide.

5.2.4. Exclusion from parenting (education)

Another form of exclusion experienced by participants was inability to reach their children's teachers regularly and easily, as well as accessing information related to their children's schooling. This results in reduced educational resources, which people may see as leading to a disparity in the quality of parenting and education.

This is an example of an especially consequential form of exclusion that may occur as a result of non-use of the internet in today's digitalised society, as schools are increasingly adopting technology to gather, distribute and share information and data relating to schools and students.

I found that actually there have been a few things that I've been lucky to hear about from other mothers by word of mouth... because I found it wasn't on a note sent home. (Rachel, a non-user/40s/female)

My son has a friend and his mother doesn't have a computer and the teacher said to her, 'When you keep your son home from school, you have to send me an email telling me that your son will not be at school.' In response my friend said, 'I haven't got a computer.' Then the teacher said, 'You have to get somebody, your husband, someone, to let me know that your child won't be at school the next day.' And she said, 'I just can't, I haven't got a computer. (Layla, a user only through a smartphone, 30s/female)

I think even to book an appointment with a teacher these days you have to send an email to them. It makes it really hard if parents aren't using the internet. (Same as above)

Louise, as a mother of two children in their early 20s, reflected on experiencing changes in the school system and mentioned how difficult it would be to not use the internet in today's school system.

Before, newsletters from school, you could receive like hardcopy, or paper. But now, this has changed. Everything is posted online or by email. Before,

children came home from school with a newsletter, but now all information is sent by email. I think you can't avoid having a computer. I don't know how many people don't have computers. I think it would be strange these days for me to not have a computer or email.

Digital exclusion of parents can affect their children. Parents who do not use the internet may struggle to keep up-to-date, as an increasing number of administrative processes at school, such as enrolment systems, have been moved online. Given the importance of keeping up with school related information, this can be a critical level of exclusion that affects both parents and children.

When I enrolled my son last year, I went up and filled out the paperwork and then, this year, one of the teachers came up to me and said, 'Is your daughter studying in kindy [kindergarten]?' I said, 'Yes,' and she said, 'You know, we don't do enrolment using paper anymore, you've got to do it on the internet. (Rachel, a non-user/40s/female)

There was a letter sent home yesterday about their plans for next year. New plans involving what they haven't done yet or what they are planning during next year are introduced via weekly email now... Parents need to know something is going on with their child, who might be reprimanded for some behaviour that wasn't, you know, a particularly right choice for the child to make... So, they're using the internet and the email system now to let parents know whether their kids have done something good or something bad, which for a parent who doesn't use the internet is not a good thing. (Layla, a user only through a smartphone/30s/female)

Furthermore, from the interview with Peter, it was observed that the way in which parents share information and resources relating to their children's schooling are changing. Peter did not use Facebook and found that he was unable to participate in parent communities as a result of remaining outside the digital mainstream.

Peter: I'm fortunate because my wife is on Facebook. And so, she will like the school things. And she will tell me what's on there if I need to know. You know, there's a meeting on tonight or there's this or there's that. They just send out a notice for parents online. So, yeah, she will keep me updated. But I realise that, yeah, without her I would need to be on there because it's expected.

Peter: There was a late meeting cancellation and they just sent out the notice on Facebook. If I didn't follow them on Facebook I'd be driving for half an hour to get to that meeting. So, I imagine that's going to annoy a lot of people who turn up for that meeting.

It is notable that Peter is indeed a skilled, active user and did not just want to use Facebook. However, by not engaging in changes in the communication of the social groups in which he was involved, he experienced exclusion.

Changes in education surrounding digital technology have implications for parenting. As a non-user, Rachel found many difficulties in guiding her third son, whose primary school started introducing online game programs as an educational material in order to assist students with their mathematics and English. She observed considerable differences between her youngest son's education and that of her first two college-aged children.

Rachel: He's online doing the things; it's called Reading Eggs. That's one thing he logs into and goes onto.

Interviewer: Compared to your first two children, when they went to school...

Rachel: They didn't really get into computers until they were in high school.

(.....)

Actually, everything is different from when my first one was born. I spend like an hour reading with Robin [Rachel's youngest son], and helping him with things like reading games.

In the interview with Rachel, she often expressed concerns about assisting her son with his online educational games and her son being left behind. Her attempts to ask for help from a local library and her perceived strong need to learn basic computer skills are relevant to her increasing concerns.

Today's parents are encountering a rapidly changing educational system as well as changes in involvement in school-related activities that involve communicating and sharing with schools and teachers. Schools, and indeed society at large, tend to take it for granted that all parents are going to adapt to new systems easily and smoothly. However, as shown in interviews with school parents who are non-users of relevant technologies like the internet and social networking sites, it is not always the case that parents can transition so easily. The numerous benefits associated with the innovative use of digital technology in education have been particularly well documented, and include the possibility of distributing and sharing individual and school data efficiently. However, from the perspective of non-users, new information technologies make it more difficult to access system-based resources and information than before.

Non- and limited users interviewed in this study reported their experiences of exclusion as a result of not being digitally enabled in various dimensions of life, including socialising, information sharing, education, economic activities, public service, culture and entertainment. Furthermore, where they live was also relevant to them being digitally enabled. Limited access availability and unreliable internet connections cause regional communities to be digitally isolated from social systems and public resources.

As a result, most interviewees felt they had been left behind in society and were missing out on something. Such shared feelings among the interviewees were not merely unpleasant sentiments accompanying a feeling of inconvenience as a result of not using ICT, but rather a fear that they may soon not be able to lead their lives in the way they used to. During the conversation between Samuel and his wife Anna in the interview, Samuel's comments showed how non- and less skilled users like himself may perceive the rapidly changing world of ICT. The conversation also reflected the fear associated with remaining outside the digital mainstream, particularly in the use of the word "survival".

Samuel: I just want to learn basic searching for survival, [such as those skills] you need to get money from the bank and also for sending emails.

Anna: Everything is coming that way, go to the bank and you wait for an hour if you want to see a teller, whereas you get online and you can pay your bills and not have to stand or line up in the motor registry or places like that. It is much quicker than you can do it otherwise that way, and I think it's become quite a lot safer than it used to be, you know, banks are very conscious of safety and everything.

Samuel: The other thing is, shopping is becoming more and more internet based. You know, your grocery shopping has started to be done on the internet and who knows, in ten years' time, if you want to have people serve you, it might all be done on the internet. It's a case of survival.

Anna: I guess, yes, looking at the future, how things can change and how more and more things are being done in that way, you know, like banking, shopping, anything like that. Eventually shops will become pretty unimportant because everyone goes and buys things online.

The next section will discuss the feeling of not being able to (fully) engage in digital mainstream, and the consequence of such a feeling – a recognition of "deprivation", which refers not to a lack of ICT access and use, but instead to an inability to fully access and use social resources via ICT.

5.2.5. Relative digital deprivation

5.2.5.1. Feelings associated with experiences of exclusion

The exclusion from diverse dimensions of social life that resulted from not being digitally enabled affected individuals' feelings and shaped their attitudes towards technology. This section explores attitudes and perceptions towards technology adoption.

As I continued to interview, the experiences of "being excluded" described in the previous section were accompanied by several common feelings: that of being left behind in society,

missing out on resources, pressure to learn to use technology, a sense of disconnection from others, and being ineffectual. For example, some of these feelings were demonstrated in Jane's responses:

Well, if you haven't got a mobile phone, internet, something like that, you are sort of left behind, I suppose everyone assumes you have an email wherever you go, whatever you hear, it is something .com.au, isn't it? Nobody gives you an address and phone number anymore, it's an email address instead.

These sentiments were echoed by other interviewees (Scarlet; Rachel; Louise) comparing themselves with acquaintances, friends and family members who use the internet and computers.

Louise: Because I found my friends using the internet, for me, I thought [I had] no choice... I can't live any longer without it (.....) Most people that I know, they are much better than me. But, you know of course it's not an excuse for why I am behind, you know. Someone says I should have learned earlier. All members of my family are more advanced than me.

The feeling of being left behind in society was also associated with realising changed social environments surrounding ICT in which non- and limited use of the internet can bring about a sense of missing out on information and resources perceived as inaccessible.

William: I have to keep up with what is happening in the world, in the city. I do need to check my SMS, phone about once a day, and check emails once a day. Otherwise, I am not in the loop with what is happening. I can't avoid it. Whether I like it or not does not matter, the fact is that I have to do it. I find to be part of the community I need to at least keep awareness of how to access the information which is there. That's why I do it, I am not interested in playing with the computer.

Rachel: I might not be able to use it but just want to know how to use it. It [the internet] looks very helpful, kids can connect with the world, and kids are educated and know what's going on there... I feel I miss out...

Scarlet: We have missed 15 years of information that we could have been drawing on if we used the internet.

These sentiments resulted from participants comparing themselves with other members of society who make use of ICT and a changed social environment. Comparing themselves to others made them realise that they were missing opportunities to access information and resources.

It is worth pointing out that non- and limited use of ICT *per se* does not seem to cause these feelings; instead, they seem to result from recognition of the deprivation of opportunities which are seemingly accessible to society's members other than themselves.

For example, Scarlet, one of the non-user interviewees, once had a friend who acted as a proxy user for her, such as by searching for information that she needed. However, after he moved to Brisbane, Scarlet realised that she needed somebody else to help her. She regretfully professed, *"I guess that made me lazy because he was doing everything"*. In the absence of her friend, Scarlet began to recognise her deprivation and her increasing exclusion from the always-on information accessible to members of her social groups and, thus, felt a desperate need to use the internet. Observing how people make use of the internet in their social and economic lifestyles, she started to believe that being able to use the internet would give her the opportunity to enjoy her life and access more information and fun, in particular, when it came to her hobby, dancing.

Scarlet: When we were going to Sydney for a dancing competition, it's just amazing what the people in that studio did, first of all, I got a message that Barbara [one of the members of the dancing studio] found accommodation on the internet, of course, which I couldn't access. Usually when I go with a friend of mine, it costs \$500 for two nights... but she went through [the internet and] got a special, it was \$99 for a twin room for two nights on the website. I mean that's the internet. It's absolutely fantastic how you can save money and how you can enjoy yourself.

Scarlet: When I was doing the dance ball it would be useful to go on the internet. I guess at the moment I would be interested in dancing because it's relevant, particularly for my age which is just a small miracle, it's all about passion, which we need and keeps well.

Another non-user, Rachel, also started to recognise her deprivation when she encountered situations in which she was excluded from opportunities to attend social activities closely related to her daily life, such as parenting and searching for information, as described in the previous section. By recognising the deprivation that accompanied such experiences of exclusion, she often felt left behind, that she had missed out on information, and that she was not connected to society and people.

I am not well connected to everyone else, to what's going on...

When it came to education in particular, she felt ineffectual in helping her children with their school work/education.

Rachel: It's too much for me; it's a bit scary for me.

Interviewer: What makes you feel scared of technology?

Rachel: Just, you know, if my husband is not around, I have trouble, I can't work it out. So, my concern is not being able to help my kids if they need their homework done.

Louise, a novice user, also recognised her deprivation in the form of not being able to stay in touch with others when she observed her friends actively engaging in online communication activities, such as email and social networking sites. She felt that she had been left behind as a result of not engaging in such activities online, as quoted above.

For Louise, observations of those around her using the internet with advanced skills in ICT motivated her to start learning how to use the internet and computer. Changes in her attitude towards deprivation were captured during the course of the interview. She often compared with her past status of non-use in explaining how she presently used the internet in her day-to-day life and enjoyed the online activities that she had learned to engage in. She felt positive feelings, particularly more confidence in her life, by narrowing her relative deprivation compared to others, as well as reversing her past non-engagement with the internet.

Louise: The trends have now changed. For instance, the post office is losing money because people all send emails. No one writes mail. You know, even now, this morning, I went to the doctor at a small medical centre. They said you can book an appointment by email. Before, you could ring or meet in person, but now you can book by email. My husband took a photo of the email address, it's easy, you don't even need to make a phone call. Sometimes you have to wait and they put you on hold. I think, this kind may be easier, because then you have something to prove [you made an appointment]. Because on the phone, you have no record when they make a mistake, but when you send an email, you can prove when something happened. This is another advantage. You can send an email in the evening, midnight, early morning... this is the beauty. You can send the email anytime. This is more convenient.

Louise: Previously, I went overseas to visit my family. I couldn't be in touch by email, because I didn't know how to use it. They sent emails and used the computer. Now, last time when I went, even waiting in the airport in Singapore, I sent them emails and it was for free while waiting for the flight. It's surprising.

Further, Louise seemed to become even more confident when envisaging herself being able to continue using the internet, which would allow her to be able to communicate with her family and grandchildren online.

You know, my mother is 82... If she knows how to use the internet, we could have contact via Skype. In the future, when I am 70, 80 years old, I can be in touch in my nursing home with my grandchildren. I think, as long as you learn, you will remember the basics of the internet or computer. The basic skills will stay with me, which will help me in the future. So when I open and read an email from my daughter or granddaughter saying, 'hi, grandma, I am here, these are my pictures from Europe, I'm having a good holiday', I won't be lonely.

Such positive responses to engaging in online activities were also observed in the interview with Parker, a novice user. Parker expressed his positive feelings about his internet use over the last few months.

Parker: I felt before that I was being left behind, but understanding how to use the internet is different.

Interviewer: Would you say now you're more confident?

Parker: Yes, yes! And comfortable too. I can click on, and get all that I want to see and like to see - instant access!

Being connected goes even further for Parker, resulting in him experiencing increased confidence in all areas of his life as a result of his online communication with friends.

5.2.5.2. Recognising relative digital deprivation and its response: reluctance to ask for help

Non- and limited engagement online and the resulting experience of being excluded from opportunities which enable users to benefit from digital engagement in their social and economic lives, can diminish people's confidence. Lily, who was working in an administrative position, expressed her lack of confidence in using the internet, even though she needed to use it at work.

I don't do enough of it. At work it's alright because I know what I'm doing there. When you're familiar with the program that you're doing, it's quite easy, but if you want to do something different... my personal use is probably not quite as good as the business side of it.

When I asked her about digital skills, I expected that she would have perceived her skills as more advanced than others considering her continued use of the internet and computer at work. However, further along in the interview, I was able to understand her perceived lack of confidence when it came to personal use.

I was surprised. There was a lady and she would have been older than me. She was, had one of those watches, one of those, not a watch but the fitness, FitBit thing. And she said, oh, no I have to do a lot of walking because the doctor said

to her that. So, her husband or some family member gave her this. She said, oh, it even gives me my pulse and tells me this. She was quite fascinated by it... Someone gave me a smart phone the other day but I said oh, no. I don't know how to get the thing to work. I said I'm a bit dumb. I said I can't get the mobile phone to work.

By continually observing people actively engaging in and catching up with up-to-date trends, such as Fitbits and smartphones, Lily recognised her relative deprivation in her personal use of digital technologies. The opportunities were accompanied by being able to engage in digital health management to monitor and measure one's health status via wearable digital gadgets. Her comment on the smartphone that her son gave her demonstrates the underlying reason that she perceived her computer and internet related skills to be lower than those of others.

Perceived deprivation resulting from non- and limited engagement in ICT is relative and social, because it is recognised by comparing oneself with others. It follows then that the more there is observation of other members of society using technology, the higher the perception of deprivation may become among non- or limited users. Further, the expectation that everyone is a "user" of the internet and well-acquainted with such technologies would appear to result in an attitude of "being reluctant to ask for help". Many non- and limited user interviewees expressed their discomfort at asking someone to help them use technology when I posed the question, "Would it make you uncomfortable to ask someone about the internet or computer?"

Emily: I'd feel a bit uncomfortable about it.

Jane: Probably yes, I would be reluctant to ask for help... Most people know how to use technology, especially the younger generation, who all know how to use it and what it is all about. Maybe older people feel a little bit uncomfortable having to learn these things. Old generation would be reluctant to ask for help.

The perception that others "all know how to use" was pervasive among the interviewees, and was accompanied by a feeling of being stupid or silly as a result of asking basic or simple questions.

Anna: I think, sometimes, probably you feel a little bit stupid if you can't work it out. You know, if someone doesn't know much about it, they might feel they're dumb or something like that because they can't.

Samuel: If somebody knows something about computers, and you know nothing, the question you might ask him might seem to him to be a dumb question.

This was well-captured in the following conversation with Jackson, in which he recounted his “embarrassment” at asking trainers about laptop functions during one-on-one training sessions.

Jackson: The hub... I both appreciate its existence and am embarrassed that I have to take up people’s time teaching me how to use the machine. I feel stupid coming back and saying ‘look, I can’t make this page bigger or smaller, I can’t shift this area to that area, I have trouble opening a document, I have forgotten how to do it’, so for me it’s embarrassing...

Interviewer: Do you think such an experience makes you reluctant to learn more about computers?

Jackson: Yes! Because I am embarrassed to ask stupid questions... If you learn a language you feel so much better if you can express yourself in that language. I can’t express myself in this language.

Samuel also mentioned the fundamental difference between the technological understanding of digital natives – those who were born into and raised in the digital world – and that of digital migrants – those who were born or brought up before the widespread use of digital technology. This shows how difficult it is for those who are not familiar with digital technology, such as non- and limited users, as well as novice users like Samuel, to use the internet in today’s society, where internet skills are taken for granted.

A lot of times, people don’t realise that computers came in the middle of our lives. For young people it was at the start of their lives, so they are so far advanced. We are just sort of learning and, people my age, we are over the hill and we are trying to learn.

It is worth mentioning that Louise, a novice user, responded that she did not feel uncomfortable asking for help.

I don’t feel shame to admit that I don’t know how to use this. So I will be brave to ask, for example, if my good friend, who I know is much better, if I ask her to show me this, I will come to her and ask for her help.

However, her use of the words “shame”, “being brave to ask”, and “asking my good friend”, implied there is stigma attached to not knowing much about the internet and computers.

The importance of non-use of ICT in the contemporary context is strongly influenced by its perceived relationship with social exclusion. It is believed that those who do not make use of ICT are likely to be excluded, not just from the use, but also from society. The circumstances of exclusion surrounding non-use of the internet or computers that were revealed in the interviews demonstrate the risks faced by those who cannot or do not make use of these technologies. New systems and applications that are increasingly digitalised can be a double

challenge for those who do not adopt relevant technologies. In particular, in areas where new technology and innovation are increasingly used to introduce, access and manage clients and customers, those who are non-users or less skilled users may be more neglected, as it is assumed that everyone can access and use technology. This exclusion leads to “deprivation”, which refers not to a lack of ICT access and use, but rather to not being able to access and use social resources via ICT. This deprivation becomes prominent when individuals compare themselves to others and when they note society’s assumption that they can use the internet and computers. Furthermore, such a recognition of their relative deprivation made the digitally excluded reluctant to ask for support and assistance, which is a significant reason why it is difficult to resolve the issue of digital exclusion.

These interviews aimed not only to determine the circumstances of exclusion surrounding ICT non- and limited use, but also to identify the meaning of “being excluded”. In other words, this project aimed to determine the consequences of exclusion for those who cannot or do not use ICT in effective and efficient ways. In this last section of the research findings, the interview data related to a “perceived relative deprivation” in digital engagement and the response of the digitally excluded in the form of a “reluctance to ask” were presented. The personal experiences, perceptions and feelings of non- and limited users when it comes to ICT sheds new light on the social circumstances and contexts that must be taken into account to facilitate digital inclusion.

Technology is socially constructed; hence the social context in which individuals find themselves is important. Also, technology is relative, as a deprivation of technology-enabled opportunities can be recognised by comparing oneself with other individuals, such as peers. Therefore, digital exclusion is very complex and requires appropriate solutions. In other words, there is no one size fits all strategy.

5.3. Social encouragement and support: key vehicles for digital inclusion

The underlying circumstances encountered by non-users clearly show that non-user participants are challenged in many ways, and that societal or contextual discouragement rather than personal choice can result in continuing non-engagement online. For example, several interviewees explained how difficult it was for some people to get started using the internet without support and help from others.

When it comes to reasons for non-use, considerable attention has traditionally been paid to such individual factors as lack of need, interest and motivation. The reasons for not using the internet revealed by interviews with non-users, however, were more closely associated with social circumstances, including family, community and greater society, than such personal attitudes as motivation.

Non-users may remain offline because they are discouraged by many contextual factors, including a lack of support from the social groups closest to them (family or friends), and community and society more broadly. In this sense, the issue of non-use is far beyond the individual's own capability. Instead, it is based on social influence variables like social dis/encouragement. Scarlet described her firm opinion that social encouragement is necessary for engaging non-users. Her words show how social support is important in ensuring non-users feel encouraged to use the internet.

I think we all could learn. It's a lack of instruction, this sort of age group; they think we are too old to learn. But we are not, if you get a good teacher, you do need somebody, then I don't feel so stupid. (Scarlet, a non-user/80s/female)

The following section explores how social support and encouragement, including from family and formal organisations such as public libraries, plays a critical role in increasing digital engagement, and approach from the perspective of novice learners.

5.3.1. Family and friend support: benefits and challenges

A theme of social support emerged from the interview data as the interviewees talked about their direct and indirect experiences of the internet and computer in their daily lives. There was a distinct difference between those who had family members or friends from whom to ask for computer-related help and those who did not. This made a considerable difference in continuing online engagement for limited users, including novice users, as well as for non-users in starting to use the internet.

For example, during Jane's interview, after I raised a question about her attitude towards starting to learn how to use the internet, Jane told me that she was expecting an iPad as a Christmas present from her children soon. She replied:

Interviewer: Would you like to learn about the internet once you get an iPad?

Jane: Yes, I would, actually. The kids offer, everyone has offered, Sarah [neighbour] offered me, saying if you want to learn, come and knock the door.

Interviewer: Would you like to try any computer sessions provided by local

libraries?

Jane: Yes, I believe they do classes at the local library. I have a sister who worked in a library in Canberra for a long time, she will organise something for me.

It is clear that Jane's family members and neighbours encouraged her to start using the internet by expressing their willingness to help her learn. This had a positive effect on her motivation to start using the internet in the near future. When she answered the question about her perception of the difficulty of internet use, her positive attitude when she mentioned the support she gained from her social network was observed.

Interviewer: Do you feel that it would be difficult to use it?

Jane: I don't think it's as hard as I originally thought, because I never thought I would use it. I can use a phone, because I always had a home phone, but I never thought I would be sending messages... I have got plenty of people who will be happy to help and tell me what to do.

In Samuel's case, such encouragement from family members also triggered his interest in using the internet and encouraged him to engage in continuing use of the internet. During the interview with Samuel and his wife, Anna, I was able to see how he was encouraged to start using the internet in his 60s after retiring. Anna saw the benefits of digital engagement and continued giving Samuel confidence to try it, even though he was not really interested at first.

Samuel: Well, Anna is using it and she encouraged me to start. I just wanted to learn a bit.

Anna: You [Samuel] didn't take a lot of encouraging because at that time you were buying a car. You wanted to look up all the different ones and compare them and everything. That was sort of the start of it a bit I think... After that you looked up other things, you know how to look up things...

Interviewer: Did you think there would be many benefits of him using the internet?

Anna: Yes, there are a lot of interesting things [you can] look up. You know, it doesn't matter what you are interested in, there is always something you can look up and find out more about... He enjoys what he has done.

Interviewer: Do you think the experience has affected your perception of the internet?

Samuel: I think so, because the internet's becoming more and more part of everyday life and if you don't try again and get involved, you fall behind, and you don't know what's going on.

By recognising Samuel's interest in new cars, Anna's approach to supporting him was particularly effective, as it was based on a recognised motivation for use. Parker, a novice user who started learning the internet in his 60s after retiring, also commented on the support available from family members and acquaintances, from whom he could ask for help.

Parker: My daughter, sons, they're all experts. My daughter set it [Facebook] up.

Interviewer: When you have some problems using the computer, do you call your daughter?

Parker: Daughter-in-law, son. I can drive up and bring my laptop to them and ask. I have got some friends here to ask to help me with the internet.

Parker also mentioned his neighbour, who helped him with his computer and the internet, just as his family did. This contributed to his decision to start using the computer.

I have got a neighbour. She works in customs, she is excellent. ... She shows me how to do this, quite helpful.

Skilled family members and friends played the role of "IT supporters" for other less skilled/inexperienced people. Such support in using the internet and digital devices is particularly important in addressing problems because it made participants feel comfortable asking for help in many cases.

If we have a problem with anything, my daughter comes down. She's been three times, four times this year; she called herself 'IT helper'. Most things, with just a bit of common sense and a bit of patience, you work them out.
(Anna, a regular, narrow user/60s/female)

Clara also had IT supporters: her two sons, who work as a programmer and IT engineer respectively. She asked her sons for help anytime she experienced problems with her digital devices. Help from her sons made her more confident in her internet use.

It doesn't matter how easy it is... Sometimes I'll get frustrated and I'll ring my son up and say 'Oh, what do I do about so and so'. 'Mum, I've told you what to do. You do this, you know. Do this. Go to the help section. Or he'll do it over Skype or we'll do it on email where he can access my computer from his home.'
(Clara, a regular, skilled user/70s/female)

It is worth mentioning that all the interviewees above had children living away from them in other cities. In spite of such distance constraints, family help was a key factor influencing less skilled/inexperienced users' continuing and active engagement in online activities, as it enabled them to resolve technical problems that would otherwise discourage them from broadening their online engagement. This was especially relevant in the case of the elderly living alone, like Parker and Clara.

However, there were also challenges reported by some interviewees when it came to seeking help from family members, who were sometimes described as "too busy to help" and "passing the buck". By entirely relying on family assistance, some interviewees experienced

indefinite delay in setting up their new devices or sorting out the problems they encountered. When I asked Lily, “do you use a smartphone?”, she responded:

No, I don't have one. My son gave me a little one for Christmas but he forgot to tell me how to work it. I said you've already paid the first month. I said you forgot to tell me how to find the keyboard. I couldn't even find the keyboard to go to messages here. I opened it up and I said well, how do I find the keyboard? I said this is absolutely useless. (Lily, a regular, narrow user/60s/female)

She seemed to be rather frustrated by the continued delay setting up the new smartphone, further lamenting, “I don't know how to get the thing to work. I said I'm a bit dumb. I said I can't get the mobile phone to work.”

Seeking help from family sometimes seemed to be inefficient, as some family members kept passing the buck to another because, as some interviewees such as Lily and Scarlet mentioned, “they're too busy”.

Well, my granddaughter was supposed to come around and show me how to use it. She said she would but she's too busy with her studies. And then she said, “Oh, mum can show you.” My daughter is a midwife at Calvary Hospital, so I don't see her often either. (Lily, a regular, narrow user/60s/female)

Rachel found it difficult to learn from her husband and hoped to have public training sessions instead.

Interviewer: Would you like to attend public training sessions if they are provided?

Rachel: Yes, it would be good if they have classes you can go to... Because my husband is really good but I really wouldn't want him to help me out [laughing].

Interviewer: Why is that?

Rachel: Because, I don't know, he is really smart and I frustrate the hell out of him.

She implicitly expressed that she had experienced some discouragement from her husband.

It is worth noting that Rachel lived surrounded by digital technology as a result of skilled user family members, such as her husband and son. Even though she could look over their shoulders while they used the internet, such experiences did not drive her to start using the internet herself. Her husband and son acted as her proxies from time to time, but it seemed that they did not encourage her to start learning the internet and computer. In some ways, such proxy uses can also be one of factors discouraging non-user family members even though it is not intended.

Another type of discouragement from family members was observed during the interview with Emily. When I asked if anyone could assist her with online activities, she said:

No, not really [laughing]. When I bought this computer, my younger son came with me. I wanted something smaller, like an iPad, a tablet thing, or a laptop with a bigger sort of screen, because I have trouble with my vision sometimes. 'No, no mum,' he insisted. 'I'm getting a big one, the size of the television.' And I was really upset, but he said, 'you need a bigger screen size you can see. (Emily, a regular, narrow user/70s/female).

Although her son chose a desktop of a larger size in consideration of her vision, Emily felt uncomfortable at her opinion being disregarded by her son, as expert in digital devices.

Family expertise can at times cause non-users and novice users to experience relative deprivation of the sort Parker and Louise expressed.

All of us, my family are all expert. They are really good [at using the internet]. It makes me feel like an idiot... (Parker, a novice user/60s/male)

All members of my family are more advanced... I just want to reach their level, the gap between what they know about technology is not that big, you know, I am here, they are here [gesturing with hands] so I just want to be a little bit closer to them. (Louise, a novice user/50s/female)

Such a feeling was echoed by other interviewees, who compared themselves with family members who were much better at using the internet and computers. This may be because family members are the closest reference group for social comparison, and especially highlight relative deprivation in digital technology use.

The quotes above show that family support and encouragement play significant roles in motivating non- and limited users to start and extend their online engagement. Indeed, family support would appear to be a vital resource for digital inclusion because family members not only help sort out technical problems with the internet and digital devices if needed, but also encourage users to be more confident online by sharing their digital culture.

I think they feel proud of me. When I send an email, I can put a smiling face, and my son says, 'Oh mum, you can do this'. I can make it bold, highlighted, underlined. (Louise, a novice user/50s/female)

Furthermore, family expertise and help would seem to enable inexperienced and less skilled users to continue their use of technology as they can easily ask for help, which can be a course of learning in informal settings. Given the value of family assistance, more isolated

non- and limited users who cannot find proxy users or ask family for help may remain digitally excluded. This links to another form of social support, the digital training program.

5.3.2. Social support: digital training programs

Many of the participants had sought out support, including paid courses, through training programs provided by organisations like local libraries, universities and telecommunication providers. However, their feelings about such training programs varied.

Louise, a novice user, was a regular visitor at the ACT Digital Hub, an IT learning centre for local people. Every Wednesday she attended morning one-on-one sessions. During an interview with her, she often expressed how she enjoyed visiting the Hub.

I have visited the Digital Hub weekly to learn for the past six months. Once you find out how many interesting things you can find there, you come more often.

When she talked about how she came to first visit the Hub, she appeared to view her discovery of its services as “serendipitous”.

It was actually last July. My son had a small operation in hospital. I was waiting and just found a brochure to read. It was about the Digital Hub. This is how I found out about it. Then I came to the library and they booked me in for the first lesson... It was by accident. I remember when they opened the library, the local newspapers wrote about the internet lessons. I just cut out the information and put it away... And I found it again in the hospital. That's amazing. So, you know, sometimes everything happens for a reason.

As the conversation with her continued, the reason that she valued frequently visiting the Hub became evident. Louise believed that she would be able to build the basic foundations of being digitally enabled through regular assistance and support. By obtaining basic skills from such digital training programs, she believed she would be able to go further in asking for help from family members and taking paid advanced courses in the future. This has important implications for the intermediary role of public learning resources in supporting those who need assistance and help to become users.

Interviewer: You know what facilities are available. Do you think it's important for public centres or organisations to provide such training programs to encourage people?

Louise: Yes, I think so, and it should be basic because then some beginners can take part and have a try. Basic, like sending and reading emails.. And then, if they think that's ok and can go further and pay for training courses. You know the basics if you learn from the library, so then, you can ask another member of

the family, like a daughter, or son, or grandchild to show you... If you are more interested, you can learn from someone who can teach you, plus you can learn by yourself.

Also, her following comments show that along with building basic foundations, encouraging the digitally excluded to be more involved in technology is crucial for ensuring that these resources enhance digital inclusion, because she believed that everyone can find technology interesting and useful in their lives.

I think we need to remember that old people have health problems, as well as good moods, good spirits, happy, you know. They say old people should train the brain, puzzles, Sudoku. This is very important because the brain still needs to learn. But, if there are some health problems, people give up easily, lose interest, feel stressed. But I think if they start learning how to use computers, most will continue if they find something interesting.

Jackson, another regular visitor of the Digital Hub, also appreciated assistance and support in using the technology it provides, acknowledging its value for him.

I always say if you want information, you ask a librarian. This is quite a true and honest statement. If you want to know something, you ask a librarian... Thank heavens that the government here did allow the funding of the public library system to provide the Hub service. I have come to the Hub to learn how to use the letter writing program, which is called WordPad, and how to research and email. That's all I am interested in, and I still need to come back here every month with little problems. Today I had a problem where I couldn't get a letter from draft emails. It was a very simple thing to open it and send it, but I couldn't find the system, so I brought that problem in today. It was solved in one min, so the fact we have a public funded system which is brilliant means I don't mind paying my taxes.

This acknowledgement was echoed in the conversation with Parker, who was a novice learner and attending one-on-one digital training sessions at a library near his house, as well as a Telstra digital training centre twice a week. He enjoyed learning from the training sessions, which had become part of his routine six months after starting learning.

They assist me with technology. Learning there, Telstra and at the library, it takes about one hour. Initially, I wasn't quite sure about Facebook. They assisted me in how to use Facebook and email. I've been using email to consult with a travel agency.

The three interviewees above had several things in common: they were aware of the availability and accessibility of public resources; they found these to be very useful in learning and seeking assistance with the computer and internet; and they were actively engaged in making use of such resources. Furthermore, by continuing to participate in the

training sessions, they accumulated a sense of the value of digital technologies and were encouraged to extend their use of the internet.

There were also some commonalities in terms of the personal circumstances observed among interviewees, especially when it came to personal ownership of a computer, especially a laptop, and home internet access. Interviewees tended to take their own laptops to the one-on-one sessions, which made them understand the assistance they received more quickly, particularly with problems that were occurring in their devices, and helped them review what they had learned from the sessions when they arrived home. Furthermore, having internet access at home also contributed to their routine use of the internet, which in turn motivated them to revisit the centres to learn more about the computer and internet.

A similar notion was expressed in the following comments:

How you start learning is important. The trainer showed me a good way, just from the basics, what I needed to know, a simple way but practical... It worked for me. The trainer showed me Facebook and documents. I don't need this stuff but letting us have a go and showing us... is very important.

Here, Louise highlighted the way to start learning and the role of trainers in increasing learners' interest and motivation, which can be considered "personalised support". The one-on-one support provided by the Digital Hub enabled her to start learning in her own way in a setting where her level of internet use was considered. As a result, she was able to pace the development of her digital skills.

On the other hand, Samuel, a novice learner, experienced it in a different way. Following his wife's advice, he registered for a paid computer training course for older beginners offered by a high school. However, he found it too difficult to keep up with the course.

It was too far above my head because it was talking about the mechanical parts of computers, and wanted you to learn how to work them... A lot of the course was from a first term university course which was above our heads. It was mainly theory work rather than practical work.

Samuel's wife, Anna, also commented on the course:

It was a little bit hard because he hadn't had any experience except for what I have taught him. But it was a bit hard, one of the ladies dropped out because she couldn't follow it.

When I raised a question about the level of the course, Parker expressed his feelings of disappointment as he initially expected to be able to build basic skills and knowledge in

internet and computer use. The theory-focused content of the course disappointed him because it made it difficult for those with little knowledge or experience.

Interviewer: Before starting, didn't you have information about the course...?

Parker: Well, the advertisement said that it was about computers for beginners for older people. But it wasn't, you know, it was somebody who had gone through school and used a computer and wanted to teach others.

Anna: It needed to be more hands on practice than theory - what and how the computer operates - you know, that's good to know if you want to be on that side, but someone who is old and just wants to learn how to use it, it was a bit too far above their heads.

Parker: It wasn't actually basic, quite a few of them dropped out because it was too far above their level.

Samuel's experience of learning from a formal organisation clearly shows how the one-size-fits-all approach can discourage those who are non- and inexperienced users by categorising them all as "beginners". Although Samuel increased his understanding of the computer and internet to some extent by patiently completing the course over a period of six months, unlike Louise, it did not seem to motivate him to further extend his online engagement.

There were cases of interviewees giving up learning the computer and the internet. When Scarlet discussed the problem of a lack of appropriate instructions for non-users, she provided an example of her close neighbour who dropped out of a formal course offered by a local library after a few lessons. Scarlet stated that the reason was due to a lack of correct instruction, especially a lack of personalised support that would otherwise have increased her motivation to continue to learn and build basic skills.

We don't use the internet because we don't have enough instruction. See, Lara [neighbour] was all ready to give up... If you gave her the right instruction, she would be using the internet. She only had three lessons recently because her son said he was going to get her a computer, but there were problems. But she is quite capable of learning the internet. She doesn't think so but I know she can.

Here, the role of supporters is to help reduce concerns and fears about technology itself and reassure that they can also become competent users, which is well reflected in Clara's comments on how to start teaching non-users.

For older people... if you're teaching somebody about the internet, the first thing you've got to do is kill their fear of computers because computers to the ordinary everyday person are extremely complicated. And I think the reason well, it's like when I first started to use the net, you know, you sort of pressed the wrong button. Oh, what do I do now? Panic, panic, panic.

Louise's reflection on her initial stage of learning the internet and computer supported Clara's assertion.

Before, I thought it would be more difficult, but now I think, everyone can learn, don't be afraid, because you never know before you try. So, sometimes it is just hard to start, when you start, you realise it's important, you can't give up once you find it helps you. It makes it easier, your life. For me, it's more plus than minus.

From the conversation with Anna and Samuel, the fear of technology, common among non-users, became obvious. A fear of making mistakes that may "wreck the machine" discouraged novices from learning.

Anna: You can make mistakes in that sort of situation, there was always someone for us but if there is no one to ask.. so I think it's very important for the course to tailor, to know the needs of people who are old and want to know how to use it, but need to know basic tools rather than theory stuff. I think that's particularly important for older people because when you are doing something you don't understand, the more you can build confidence, the more likely you are to use it. If your confidence is lower, you're going to say, it's too hard, I don't want to... They are too frightened to press that button.

Samuel: I think the instructor needs to go through and make a few mistakes, and say look, I made a mistake, and this is how to fix it, not going to let them give up the learning opportunity.

Clara emphasised the importance of encouraging non-users to start using the internet and computer even prior to being motivated to engage in online activities (this can be called the pre-motivated stage). This may be critical to non-users finding relevant uses for the internet and computers that can add enjoyment to their lives.

Well, I think with a lot of people, especially in the mature age group, they're frightened of the internet. And they can't see the sense in it, you know. Why do I want a computer? Why would I want to do that? But if you introduce them to a computer and they see some of the things that they can do with it, that sparks the enthusiasm level... Once your appetite is wetted you just, it's like chocolate. You have one piece. It's very difficult not to go for the second and third and onwards.

Anna's comments also highlight the importance of encouragement for non-users.

If they [instructors] provide the right sort of courses, people will get involved, but if they don't provide the right sort of course, people are not going to join in. I think for senior groups, they have got to also be involved in and try it. I don't think they will refuse it, you know how much you can learn and how much you can look up for anything. Once they know they can do a lot of different things, they will start. Getting the members involved... it's a bit hard. The instructors have got to get them interested.

Then, motivation becomes associated with a relevant purpose. For example, as Clara described:

You have to give them motivation. Yes. See, well, like elderly people that go and they draw all their pension out. And some of the poor end up getting robbed and bashed as well... Whereas, if you've got the internet where you can pay all sorts of bills and never worry about handling any cash, you know. I've got to draw out cash for bingo. But even, you know, you can even do shopping if you want to buy using your plastic card.

From the various experiences of learning at formal institutions and local libraries observed in the interviews, it was evident that formal support and assistance influences non- and inexperienced users' digital engagement. Some interviewees found their digital potential by taking part in courses, while some, on the other hand, found their limitations.

Most importantly, the outcomes of formal support and assistance varied according to individuals as a result of their different circumstances, including their internet access and device ownership, the extent of informal support they have from family and social networks, the availability and accessibility of public resources in their life, and their awareness of such resources. The resources offered by public institutions are very important in compensating for a lack of personal resources and to encourage individuals to be engaged in digital culture. A lack of understanding of individual circumstances, as well as uniform and one-size-fits-all approaches in the training programs, has negative implications for the skill development of non- and inexperienced users and those who need momentum to broaden their digital engagement.

Chapter 6 Discussion

Following analysis of how digital divide policies in Australia are addressing the issue, circumstances behind non- and limited use and emerging daily exclusion experiences were explored in the previous chapter. A review of the content of ICT strategies, policies and programs and digital divide policies revealed that, although there has been a shift in the underlying focus of ICT policy in Australia towards the meaningful and effective use of ICT, which is regarded as a key driver of the digital economy, there remain considerable gaps in the understanding of digital exclusion from this new perspective, which may have resulted in the failure of government intervention to tackle the persistent digital divide. This chapter discusses the major findings of non- and limited user interviews in-depth, aiming to understand the multifaceted circumstances and changing natures of digital exclusion in the hope of providing a better direction for digital inclusion practice from a policy standpoint.

6.1. Distinguishing apparent, observed and latent reasons of non-uses

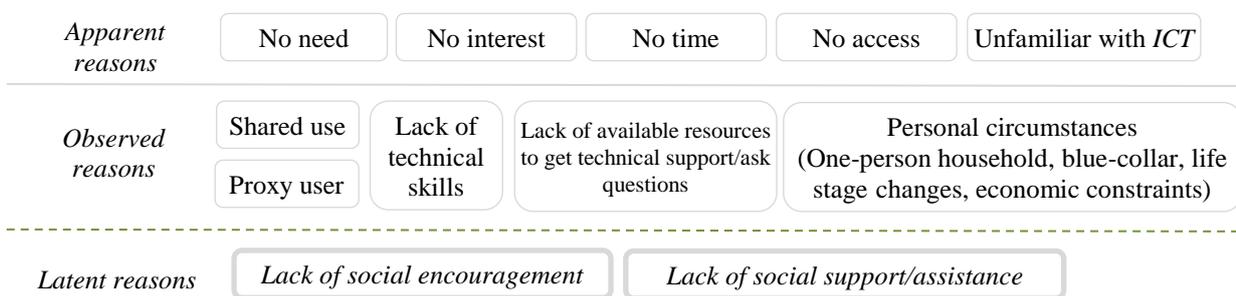
According to the latest ABS data, 1.3 million Australian households did not have internet access at home in 2014–15, accounting for 14% of total Australian households. ABS reports that the main reasons for a household not having internet access is “no need” (63%), “lack of confidence or knowledge” (22%), “cost” (16%) and “privacy or security concerns” (3%). Similar results are echoed in other survey data. For example, according to Pew Research Center (2013), the main reason for non-use among American adults aged 18 years and older is “not relevant”, which includes “not interested”, “do not want to use it”, and “have no need for it”. In the UK, Oxford Internet Surveys (2013) reports that nearly all non-users cite a lack of interest as one reason for not being online.

However, while much accumulated quantitative data has consistently shown the prominent reasons that non-users mention, such as no interest/motivation, no need, no skills/experience, cost issues, and no time, limitations in our understanding of non-users have also started to be recognised. Several researchers have begun to look closely at more nuanced reasons for non-uses, especially the meaning behind the most often cited reasons of “no interest” or “no need”, suggesting that reasons for non-use are complex and interrelated and furthermore, that the relative importance of reasons varies across individuals and circumstances (Gibson, 2006; Gonzales, 2016; Maloney, 2014; Reisdorf, Axelsson & Söderholm, 2012; Selwyn, 2006).

Due to the complexity, the reasons for not using the internet may not be explicitly captured by simply examining the statements of non-users. Several interview studies on non-users have captured the ambiguity. For example, Selwyn (2006) mentions a participant’s non-use “as not being as straightforward as evading her apparently clear opportunities to use the family computer” (p.284). Maloney (2014) states, “For all but two of the study participants, an expressed lack of interest in the internet was a general deflection, which initially obscured more specific reasons” (p.31). The ambiguity behind the reasons for non-use may be because of this plurality of peripheral influence, which may be difficult to express as a single reason. At the beginning of interviews with non-users, I attempted to understand different circumstances behind non-users remaining offline by probing the reasons. In the course of the interviews it was common for underlying reasons to emerge when interviewees talked about their personal stories involving their daily activities that are related to family, financial status, social life and work experiences.

As analysed in Chapter 5, reasons behind non-use that were consistent with the literature, “no need” or “no interest” being the apparent reasons participants stated in the interviews. However, through iterations, the reasons for not using the internet were revealed to be more multifaceted as shown in Figure 6.1. They were categorised into apparent, observed and latent reasons, where apparent reasons are the immediate responses from the participants, observed reasons are those identified through a discussion of their daily routines regarding the internet and digital technologies, and the latent reasons were the underlying themes.

Figure 6.1 Reasons for non-use



More contextual reasons associated with individuals’ circumstances of continued disengagement online were observed during the interviews. Economic constraints were related to the fact that retired pensioners who experience financial difficulties were unable to have home internet connection due to the extra cost these represented for their budget.

Furthermore, in the case of one-person households, the sporadic need for internet use did not sufficiently motivate individuals to sign up to home internet services. Most of the non-users interviewed had proxy users, which was the circumstance behind the reasons of “no need” and “no interest”. Shared use of devices, in particular with skilled family members, was observed as an underlying circumstance that some interviewees, especially housewives, encountered. Unfamiliarity with ICT was also one of the main reasons for non-use, as most retired or older interviewees had not been exposed to technology in their work-life, prior experience or school days.

However, it was observed that a lack of available resources to get technical support and ask questions and technical skills aggravated the attitude/perception of ICT use among them, which in turn led to continued non-use, despite increasing need for use. There were several personal circumstances observed, including engagement in blue-collar occupations and transition into a retirement village as a result of life stage changes, which apparently related to the reasons of “no time” to learn or “access loss”. Finally, two latent reasons for continuing and extended non-engagement emerged from interviews with non- and novice users: a lack of social encouragement and support/assistance. Towards the end of the interviews, it became clear that non- and novice users were discouraged by the many societal and contextual reasons summarised above. The important thing to understand about non-use here is that such latent circumstances ultimately hinder non-users from attempting to start learning. Nevertheless, the fact that non-users largely experience a lack of social support and encouragement has not been adequately identified and reflected in policy documents and quantitative research reports of non-users, such as national survey. By doing so, it may have resulted in policy documents failing to reflect this problem.

6.1.1. Revisiting the notion of no need/no relevance: proxy and shared use

The interviewees who participated in this research were asked to describe their daily activities before relating how they were connected to the internet or computer in their daily lives. Given the nature of their daily activities, such as visiting friends and neighbours, reading books, and gardening, it would be easy to conclude that they do not need to use the internet or computer to survive and thrive in this digital era. That is, digital technology appears not to be valued by some people. However, as the interviews progressed, interviewees provided a range of stories about ICTs in their everyday lives, which illuminated that non-users’ everyday lives are related to ICTs, despite their non-use.

One observation supporting the relevance of ICTs to non-users' lives is "proxy use". Selwyn (2006) reveals in his interviews with non-users that many non-users access computers through their social networks, including through friends, co-workers and family members. This result is confirmed by the Oxford Internet Surveys (2013), which show that 90% of ex-users and 70% of non-users report having a link to the internet if they need it. In line with these observations of the availability of proxy users, this study also found that most of the non-users interviewed had proxy users who used the internet and computer on their behalf and, further, that the notion of proxy use is of significance to understanding the circumstances behind the reason of "no need". Therefore, the literature must move towards a redefinition of this category – perhaps along the lines of 'no direct need' – as these people still need the internet in some way.

The role of proxy users is well recognised in the literature. For example, Selwyn (2006) highlights the importance of "significant others" within their social networks who can be the second hand of non-users and who encourage non-users to access the internet at proxy points (p.288). In this regard, Reisdorf and Groseelj (2015) also note the role of proxy users as being crucial to tackling primary barriers, such as physical access, skills and negative attitudes. Bakardjieva (2005) earlier conceptualised a "warm expert" and identified that learning from close friends or relatives who possesses relatively advanced knowledge of computer networks and personal familiarity with the novice user's situation and interests can be effective, and even function as a critical resource for learning and using technologies.

The interviewees illuminated their specific experiences of proxy use, such as booking a show ticket, completing forms and enrolling children at school, which may occur infrequently but are necessary activities for citizens. Proxy users enable non-users to continue participating in social and economic activities that they would otherwise be unable to complete. What is notable here is that the circumstance of proxy use seemed to underlie the extended non-use of some interviewees in this study.

Reisdorf, et al., (2012) have found that non-users who have proxy users, in particular in strong social networks, are least likely to be interested in going online, suggesting the availability of proxy users can play a role in keeping some non-users from starting to use the internet. The cases of non-user interviewees in this study further support the idea of proxy use, showing that most non-users had proxy users who enabled them to continue engaging in necessary activities online that they would otherwise be forced to do on their own. Reisdorf,

et al., (2012) suggest that if non-users who rely entirely on proxy users were to face a radical change in which their proxy users were no longer available for some reason, this would be a turning point that would encourage them to start learning the internet and computer.

Otherwise it may lead them to stop using the internet, and, although indirectly, stop participating in certain social and economic activities. In this study, Scarlet started to realise that she needed somebody to help her in order to continue what she had previously been doing through her proxy user friend, and this fueled her need to learn.

In contrast to the argument put forth by Reisdorf et al., (2012), this study observed that a gradually increasing number of situations in which non-users need proxy users to get things done online also trigger the motivation to start using the internet and computer for some non-users. In light of the fact that ICTs have been considerably integrated into almost every domain of society, the dependency on proxy users has inevitably increased, which results in some non-user interviewees feeling that “it is time to start” (Jane).

While proxy access can make the internet accessible to many who would otherwise be offline completely, it may not drive non-users to start using the internet themselves, as shown in some cases of non-users, such as Rachel (see page 54). Family members may act as proxy users, but may not encourage non-user family members to start learning the internet and computer, which may even discourage some non-users. This observation is reflected in Maloney’s study (2014), in which the majority of non-users interviewed were surrounded by family members who actively used the internet and digital technologies. However, few had experiences of family members’ support and encouragement, which represented a critical psychosocial barrier for them. When non-users point out “no need” as a main reason for non-use, it does not always mean they do not need to use or access the internet in their lives (Selwyn, 2006). Proxy access clearly shows the need for internet use among non-users, but also suggests that it can cause extended non-use due to underlying discouragement from proxies. This is because a person’s adoption of the internet is closely related to their social connections (Helsper & Reisdorf; 2016; Maloney, 2014; Reisdorf, et al., 2012). Proxies are a link to the internet for non-users, however, by not explicitly encouraging non-users and sharing what they do online with non-user members, proxies preclude non-users from directly engaging with the internet themselves (Selwyn, Johnson, Nemorin & Knight, 2016). This is not confined to elderly groups, as shown in Maloney’s (2014) study, but is also relevant to the surroundings of non-users, who grew up in a pre-digital analog era and now live with digital natives.

Sharing a household with teenagers and young adults is relevant to one's non-engagement with the internet. When it comes to household ownership of technology, there can be another context of non-use. Some participants in this study had all the necessary resources to use the internet in their household but never actually had the opportunity to do so. In this study, this was particularly the case for a full-time mother, who is the family member least likely to have priority in the use of digital media if there are a limited number of devices available in a household (Hollingworth et al., 2011; Newman, Biedrzycki & Baum, 2010), even despite her need to use the internet for the benefit of her family (see Eynon & Helsper, 2015).

There has been considerable research that recognises the importance of considering the family context in understanding individual use of the internet (Chesley, 2006; Eynon & Helsper, 2015); Haddon, 2004; Vandebroek, Verschelden, & Boonaert, 2008). Much research has focused on the role that children play in increasing adults' adoption and use of the internet, but there has been little attention placed on the digital exclusion of family members, in particular when it comes to the context of parents. Indeed, some researchers have begun to recognise that household access does not always mean the use of the internet results in benefits to the individual (Eynon & Helsper, 2015). Moreover, there may be family members who are discouraged from engaging with the internet and computer, as others in the household may dominate that particular activity (Chesley, 2006).

When it comes to internet use in households, non-use of technology by some family members may result in more complex circumstances. For example, the household structure and placement of the home computer may lead to limited use by some family members (Selwyn, 2006). From the statements collected in the interviews, it is clear that "household" ownership of technology does not always extend to "personal" ownership for all family members. Yet, personal ownership is an essential condition in determining the frequency and quality of the use of technology by individuals (Verdegem & Verhoest, 2008).

Priority is often determined according to the relative necessity of using the internet or computer for education (Lally, 2002) and work-related tasks. In this regard, Eynon and Helsper (2015) highlight the importance of taking the gendered aspect of internet use into account in the context of the household. "*Fewer access points, lower levels of confidence and less broad engagement with different aspects of the internet*" are relevant to housewives in relation to the internet use of households (p.168). In this regard, Selwyn (2006) also suggests that while gender is not a significant factor contributing to individual's non-use in his survey

data, the interview data shows gender still remains an important factor. Accordingly, women's non-engagement with technology may be less visible than those who are traditionally identified as being digitally excluded. For example, the rate of "household" ownership of technology may hide young mothers' non-use. Yet, this is a critical consideration in identifying female non-users as a digitally excluded group.

A lack of interest or motivation are well represented in the policy literature as barriers to increasing internet access and use among the population (Gibson, 2006) as a result of a significant number of non-users identifying "no need" as the main reason for their non-use. However, in line with other research, this study suggests that the reason of "no need" may no longer be relevant, as social domains are increasingly moving online. The transition to digital services and products creates equity challenges for those who are not digitally enabled (Middleton, 2014; Van Deursen & Helsper, 2016). Leung (2014) criticises such a "Build it and they will come" approach to the digital divide, in particular relating to the e-government system.

6.1.2. Revisiting the notion of a lack of digital skills

It all comes down to support for non-users and familiarity

In terms of the reasons for non-use reported in several pieces of tracking research, there is a noticeable common change observed over the last few years. According to Pew Research Centre (2013), issues related to the difficulty of using the internet were more prominent in 2013 than in 2010 as a main reason for offline adults not using the internet. This also accords with the results of Digital Future studies (Centre for the Digital Future, 2015), which show a continuing increase from 2001 in "lack of knowledge (don't know how to use)" being cited as a reason for not going online. This tracking data implies that technology has become more difficult to use following advancements over time.

Skills and knowledge shortages are well recognised as a main reason for non-use in the literature (Cushman & Klecun, 2006). Furthermore, some researchers reveal that these may also be the true reason behind some other mentioned reasons for non-use, such as "no need" and "no interest" (Hauge & Prieger, 2009; Maloney, 2014; Reisdorf, et al., 2012). This is further supported by the results of this study, which show that perceived difficulty of use is an underlying reason behind the stated reason of "no need" resulting from lifestyle change. In addition, this study suggests that a more nuanced understanding is critical in relation to the

issue of a lack of skills and knowledge. It is necessary to keep in mind that the significance of this reason for non-use is increasing, as shown in the tracking research above.

The issue of a lack of skills and knowledge is not explicitly stated in the accounts of non-user interviewees in this study. Instead, a range of aspects behind the issue of non-use were revealed, all of which are closely related to individual circumstances. For example, the relevance of individual circumstances is evident in Scarlet's comment describing the reason for her non-use: "don't know where to go to get the instruction". For Rachel, it is more about fear and anxiety, as expressed in "I am scared of disconnecting him", when she is referring to breaking the desktop mainly used by her husband. Many participants expressed their unfamiliarity with the internet and computer in phrases such as "wasn't educated with the internet", "didn't have exposure to technology", or "didn't have any requirement for working". In other words, as the internet was once not required in learning and working, they did not have the chance to use the internet and computer in the past. It was often observed in interviews with non-users that unfamiliarity with digital technology and digital environments was closely associated with fear and concern related to internet use.

For non-users, the issue of skills and knowledge shortages is not a cause of non-use, but rather a result of different circumstances, as social resources allowing for the use of ICTs differ among individuals. Pew Research Center (2009) finds that digital literacy is a more significant problem among certain groups, such as the elderly, the undereducated and low income households. This is because there is variation in the social resources that determine one's capability to engage with ICTs, including the people and organisations that provide technology and social support (Powell, et al., 2010). Powell, et al. (2010) highlight the importance of social infrastructure (resource) in better understanding the barriers to ICT adoption among socially marginalised groups, such as low-income groups, who are less likely to access the technology and social support provided by organisations and communities.

In this sense, the issue of basic skills and knowledge shortages among non-users represents the extent to which social resources are accessible to them. In this study, it was clear in Scarlet's case that her lack of basic skills and understanding of ICTs resulted from a lack of instruction and assistance, which was especially significant due to her limited access to informal assistance, such as from family members. Furthermore, Scarlet's negative experiences with service providers also illustrates how difficult it is for those who have

neither a basic understanding of ICTs nor informal support to gain access to technical support.

Several researchers highlight that there is variation in the significance of a “lack of digital literacy” in explaining non-use between individuals or groups (Helsper & Reisdorf, 2016; Pew Research Center, 2009), a possibility which is also observed in this study. While limited basic skills and understanding of the internet and computers were evident among non-user interviewees, the significance of this in determining their non-use varied. For example, the case of Jane, whose family members and neighbours encouraged her to start using the internet by expressing their willingness to help her learn, clearly showed that her positive perception of learning how to use the internet and computer was less related to her skills or knowledge. This is clear from her statement, “I don’t think it’s as hard as I originally thought”. She perceived the existence of accessible social resources, which was observed in her following words, “I have got plenty of people who will be happy to help and tell me what to do”. Also, her prior experience with mobile phones and her continuing observation of family members using the internet and digital devices, such as iPads and smartphones, compounded her familiarity with ICTs, and positively contributed to reassuring her that she could also become a user. The observations made in her interview were distinct from other non-users interviewed in this study in terms of experiences of support and encouragement from family members, suggesting that social infrastructure does determine one’s capability when it comes to engaging with ICTs (Powell, et al., 2010).

Along with social network support, there is another social resource which is more likely to be obtained in certain groups, resulting in variations in ICT use capability. Several studies suggest that that one’s capability to use ICTs is significantly mediated by institutional contexts, including workplaces and schools, in which access is an important functional element, and the skills and training received by members are deeper (Ferro, Helbig & Gil-Garcia, 2011; Neice, 1998). The interview data in this study further supports the idea of institutional intermediation by revealing the possession of fewer social resources by those who engage in blue-collar occupations, which relates to the reason of “no time” to learn the internet and computer.

A distinct difference in experience with ICT in their working lives was observed in the interview data between those who worked in office jobs, such as administrative/managerial workers, and in blue collar jobs, such as those operating machinery and construction. Indeed,

occupation is an important variable in explaining the adoption of technology rate (Reese, 1988; Brynin, 2006, DiMaggio & Bonikowski, 2008; Hoffman, et al., 2001). White collar workers are more likely to understand the potential uses and applications of ICT, and thereby develop positive attitudes to ICTs (Reese, 1988). The interviewees in this study delineated specific examples of disparity in encouragement in their workplaces, as well as limited opportunities to practice ICTs in their workplace or pre-retirement daily lives, which in turn extended their non-engagement with ICTs. Furthermore, there was a significant gap in the sense of familiarity with ICTs, suggesting that the obtaining of basic skills and the understanding of technology at work significantly reduced a sense of unfamiliarity with technology and negative feelings surrounding it, such as fear and concern related to internet use, which were often observed in interviews with non-users and novice users.

It is not surprising that businesses and governments prioritise training for people in office jobs, even though all would benefit. As Mesch and Talmud (2011) suggest, the replication of existing inequalities in access to occupational structures and to ICTs reproduce digital inequality. Furthermore, such a gap in access to and practice of using the internet in everyday life may result in further inequalities in other domains, such as education. For example, Hollingsworth et al. (2011) have found that parents in professional forms of employment are able to transpose the technologically mediated organisational capital, embodied skills and dispositions used in their working lives to their parenting strategies and practices; on the other hand, particular fractions of working-class parents are less likely to feel confident playing a role in their child's learning when it comes to technology. Hollingsworth et al. argue that such obtained “organisational capital”, in the form of competence using ICTs in the field of employment, can carry over into the household (p.358).

...notions of digital or generational divide may need to take into account not only unequal material resources and age, but the widening gap between those who have the opportunity to access and utilize technologies in their working lives (and which therefore augments household stocks of cultural capital through the development and activation of new dispositions) and those increasingly excluded from such experiences through the kind of work they do (manual, unskilled or simply being unemployed) (Hollingsworth et al., 2011, p.358-359).

In terms of digital literacy, interviewees in this study illuminated intertwined and complex multidimensional experiences (contexts). The issue of digital literacy shortage pertains to many different situations, where challenges hinder those who stay offline from engaging with ICTs. Obviously, such resources, supported and reinforced through professional working

lives, are less likely to be available to those who work in factories or at construction sites and who do not have the opportunity to use ICTs while on the job. This is an issue which the government should target and address in its training program.

For non-users, digital literacy is a matter of familiarity with digital technology and digital confidence (Park, Burford, Lee & Toy, 2016). In light of the fact that digital literacy is closely related to the extent of access to technology (Robinson, 2009), as the more opportunities there are, the more familiar individuals are with technology, it is important to understand the circumstances of non-users for whom the people and organisations that provide social support are less likely to be accessible, especially when it comes to the issue of skills and knowledge shortages.

6.1.3. Revisiting the notion of cost: it still matters but is complicated

It is well recognised that cost is a major factor in non-use of the internet (Pew Research Center, 2009; Reisdorf, et al., 2012; Prieger & Hu, 2008). Nevertheless, other contextual reasons associated with individuals' circumstances of continued disengagement online were observed during the interviews.

In this study, economic constraints underlying a lack of need for the internet were related to the fact that retired pensioners who experience financial difficulties were unable to access digital services due to the extra cost these represented. Furthermore, in the case of single households, a sporadic need for internet use did not sufficiently motivate individuals to purchase home internet services. Selwyn (2006) reveals from his interview data that financial barriers coupled with a fundamental lack of need for a computer provides justification for lacking either access to the device or possession of the device. In Selwyn's study, the decision not to have access to a computer is made when other important items for living are prioritised over the necessity of internet access, in particular in the case of low-income (Bryne & Dailey, 2006; Rahman & Quaddus, 2012) and single households. Booking a ticket for a holiday may not justify access to a computer. Verdegem and Verhoest (2008) suggest that the significance of cost may depend on its proportion of the household budget, which may keep certain social groups, such as low-income households with children and single households, from using the internet and computer. However, if limited or restricted access to the internet limits the social and economic activities people perform in their daily lives, the cost barrier may be more significant, in particular, in terms of education and public resources.

The affordability of technology is a relative concept that is becoming critical to the digital divide issue. Pavlidis and Gadir (2013) point out that digital divide initiatives fail to adequately consider how the affordability of telecommunications devices and services is related to the digital divide. Indeed, the ADII report (2016) shows that the affordability dimension is not improving but is going backwards as a result of the relativity of costs; people need more data and connectivity than before, so they are now spending more for less. Low socio-economic and regional communities (Morsillo, 2012; Pavlidis & Gadir, 2013; Thomas et al., 2016) are particularly impacted by the relatively low affordability of access. However, more complex and contextual factors are intertwined with cost issues when it comes to the digitally excluded, and these factors need to be raised as critical issues that have relevance to affordability.

Seale and Dutton (2012) argue that the decision to adopt ICT is influenced by a range of considerations related to personal need, such as study, and whether the benefits of using technology outweigh the perceived costs. In this regard, the need for engagement with ICTs is structured according to individual circumstances. That is why the expenses associated with ICTs may be hardly justified for those who are less involved in certain social and economic activities, which include not only the elderly and retirees but also any society's members who currently survive without ICTs (Reisdorf, et al., 2012). However, in light of the cases observed in this study, wherein it is clear that the internet is increasingly the way for individuals to complete forms, enrol children at school and claim Medicare rebates, using the internet may one day become a matter of survival, as Samuel mentioned in his interview.

6.1.4. Latent reasons for non-use: discouraged, not decided

When it comes to reasons for non-use, considerable attention has traditionally been paid to such individual factors as lack of need, interest and motivation. The reasons for not using the internet revealed by interviews with non-users, however, were more closely associated with social circumstances, including family, community and greater society, rather than such personal attitudes as motivation. Mariën and Prodnik (2014) point out that digital inclusion policies tend to individualise problems that are in fact social in nature, which is also revealed in this study. Technology use is considerably influenced by the social contexts that shape the resources, skills and motivations required to get online (Newman & Gursteinon, 2016). Such contexts include the societies to which individuals belong in a broader sense, including family, social networks and public centres or institutions, and further include any settings of

learning or gaining assistance, such as service providers, from which individuals can obtain all kinds of support and encouragement, and vice versa. Helsper (2011) argues that individuals' social and cultural capital partly determines individual choices, and can, therefore, restrict their decisions. In this sense, non-use may be a reaction to social discouragement in the surrounding circumstances.

Ultimately, non-use for the participants results from a lack of social support and assistance. Furthermore, societal and contextual discouragement rather than personal choice results in continuing non-engagement online. The important thing to understand about non-use here is that such latent circumstances ultimately hinder non-users from attempting to start learning.

Although the notion of computers or the internet lacking relevance may influence the debate around whether non-use of the internet constitutes a digital decision or digital division (Dutton, Helsper, & Gerber, 2009; Selwyne, 2006; Thorén & Kitzmann; 2015; Wyatt; 2003), a more pressing debate concerns the outcomes of continued non-engagement with technology in a digitalised world, so-called digital exclusion. Digital exclusion may not be any more a matter of choice and decision, which is driven by some extent of empowerment, than a matter of living and participating in society. In this sense, why some people do not adopt technology despite increasingly experiencing social deprivation from a lack of connectivity is a key question that can give insights into and information about digital inclusion processes. Technology adoption is not entirely up to the individual and is socially constructed (Lawson, 2007). National policies often view technology adoption on a narrow level, focusing on changing those who remain offline, rather than on understanding the circumstances and limited social support or encouragement that are the main causes of digital exclusion. Having this knowledge can help improve policies.

6.2. Reconsidering the circumstances of limited uses

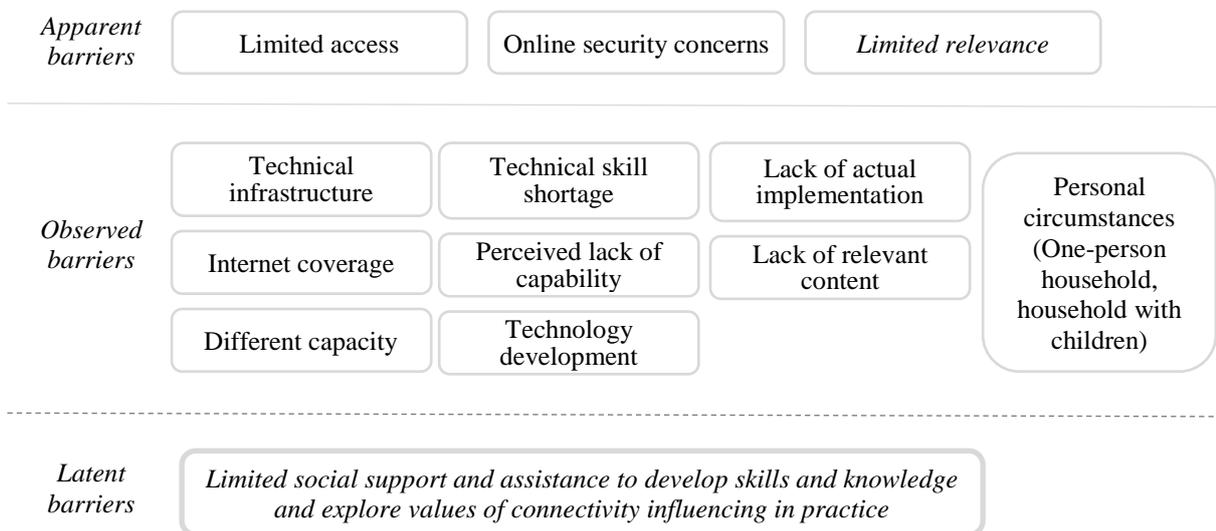
In transcending a binary approach of haves and have-nots, more attention needs to be paid to the circumstances that lead to digital exclusion and the variations that exist among users (Park, et al., 2013; Wyatt et al., 2014). Much research has started to note such variations in the level of adoption and recognised the importance of moving towards making use of technology once access is gained (Gurstein, 2003; Hilbert, 2011). This is conceptualised as “effective use” and regarded as key to enabling access to usable and useful technology for individuals' social and community objectives, which refers ultimately to digital inclusion.

Heeley and Damodaran (2009) refer to digital inclusion as a process through which individuals move from being novice users to digital innovators, which is when users employ technology effectively and further make its benefits become part of their lives (Hilbert, 2011).

However, while the notion of the effective use of technology is well recognised as a key component of digital inclusion, the steps from access to usage to effective use are ambiguous (Hilbert, 2011). Furthermore, the steps are often not automatic (Katz & Rice, 2002), which may imply that it is not all ‘haves’ or ‘users’ that do not effectively make use of and benefit from their usage. Therefore, it is crucial to determine the cases in which some users cannot move forward to effective use due to viewing technology adoption in a very limited way.

Figure 6.2 shows the underlying individual and social conditions behind limited access, online security concerns and lack of relevance, suggesting that digital exclusion can be even more significant among users who do not use the internet and computer effectively and efficiently because of technical and social resource limitations, despite having somewhat adopted it.

Figure 6.2 Barriers to internet usage



Limited technical infrastructure, coverage and different capacities matter because they inhibit the affordability of using ICT. The cost issue is not entirely determined by personal circumstances, but heterogeneous connection infrastructure which yields disparity in access availability and affordability among users. This is compounded by different household

settings, such as households with children. Technical skills shortages and a perceived lack of capability are the underlying reasons for increasing online security concerns and resulting usage restrictions. This has become more significant with rapidly evolving software and applications. Furthermore, despite the increasing digitalisation of social resources and accessibility to such resources, a lack of actual implementation of technology, which facilitates access to such resource, hinder them from seeing the significance of usage in individuals' day-to-day lives. Low and unskilled users may not be able to experience an increased sense of empowerment which influence in the processes of digitisation or in the overall presence and integration of ICTs in all life domains through the technology adoption (Mariën & Prodnik, 2014). Finally, there is limited social support and encouragement behind all the barriers observed, which ultimately hinders them from ongoing development of their use, as well as from accumulating its benefits over a period of time or continuing to explore the opportunities for empowerment in their communities and societies.

In the following sections, the participants' main reasons for limited use are considered in light of relevant literature.

6.2.1. Access: limited capacity and barriers to adequate access

It is believed that access infrastructure is widely available in particular urban areas. However, residents in the most wired regions have different internet connections, which can result in disparity of both usage and further outcomes of internet use (Holloway, 2005). Middleton (2013) highlights the importance of understanding access, which actually enables citizens to become participants in the information society. Different connections have different capacities, which in turn may contribute to disparity in individuals' capacities to benefit from the internet (Middleton, 2013; Philip, et al., 2017).

In this study, many interviewees had access to the internet at home, but types of connections differed. While some users had fixed home access, such as ADSL through a telephone line, some accessed the internet through 3G/4G mobile data only and used a pre-paid mobile broadband plan. Limited data capacity was a significant barrier for some interviewees, such as Layla and Parker, in extending their internet usage, but there was greater complexity in the range of individual circumstances, which contributes to the significance of the access issue.

Household context was critical in understanding the access issue, which leads to limited usage. For example, for households with children in this study, limited data allowance was

more significant due to increasing demands for internet use for the purpose of education (Eynon & Helsper, 2015; Hollingworth et al., 2011). In other words, parents' usage could be relegated by prioritising children's schoolwork and learning. This was more evident among households using mobile networks with a limited monthly data allowance. On the other hand, households in which only one family member used the internet were less likely to have plans with larger limits/speeds given their lower demand for the internet. This was also the case for interviewees living alone. Several interviewees in such circumstances were using mobile networks to connect their computer to the internet through a USB modem (mobile dongles), and their pre-paid mobile broadband plans allowed them only a few GB of internet.

Middleton (2014) argues that a restricted data capacity allows only limited access to particular online sites and services, which is reflected in the limited usage observed among mobile network users in this study. For learners or novice first time users, it may be difficult to choose a data plan and type of connection without first knowing their needs in terms of speed and data allowance. Donner (2015) argues wireless connections, such as mobile internet, are more trial-able than fixed internet because of its convenience and flexibility in pricing and installations. Connections with relatively simple start-ups and plans that give them more control over their budget might be preferred. Mobile networks do not require further technical infrastructure, such as a landline, technical knowledge or a commitment for a certain period, usually 12 or 24 months. As such, it seems reasonable for first-time users who are unsure of their skills and usage to want to lighten their cost burden. However, as many novice users in this study had already started to recognise an increase in their usage, it is anticipated their data usage limits will become more significant.

Furthermore, social demands for digital by default services and resources are becoming increasingly common (Middleton, 2014). It was also recognised by almost all the interviewees in this study that limited access to resources can be a critical barrier to users engaging in further activities online, such as uploading and downloading, as well as accessing certain types of platforms and content (Middleton, 2014). This is not only the case for the mobile network users observed in this study but also for those who do not have high speed and high quality connections, like broadband internet access, because increasingly digital content and service requires more advanced connections (Newman & Gurstein, 2016; Middleton, 2014).

Another observation from limited users on the access issue, which has recently emerged in the literature (Newman, et al., 2010), is landline substitution and resulting limits to accessing available internet services. As mentioned above, a fixed connection requires further technical infrastructure, such as a landline, which is not available for some households. Even though fixed lines are necessary due to an increasing need to use the internet at home, an absence of technical infrastructure hinders the availability of internet services. In this study, the case of Layla, who was using a limited data plan, illustrated this technical barrier, as she did not have the landline required to connect to broadband services.

Along with technical infrastructure issues influencing accessibility, it was also observed that literacy issues surrounding service providers and available plans also influence service accessibility. Some interviewees who did not seem to have the right plans struggled with speed, data allowance and cost issues and seemed somewhat lethargic at the prospect of searching for better alternatives to connect to the internet at home than their current services and plans. This is because they are not sure about or lack information relating to the service providers and plans available, and thus maintain their initial providers and plans rather than actively seeking out better options. Walton, Kop, Spriggs and Fitzgerald (2013) highlight the importance of ensuring all forms of internet service pricing structures and information are accessible and understandable in a way that helps individuals make meaningful comparisons. This is reflected in the observation that there is a growing need for literacy around service providers and available plans and that this is becoming increasingly crucial to ensuring the accessibility of existing infrastructure and services that can educate and inform users.

Limited data capacity was significant for some users, in particular for those who needed more engagement online for work and personal reasons, such as education and career development. In this case, the significance of limited data capacity increased and controlled individual usage, which in turn became a barrier to broadening and deepening engagement online.

Van Deursen and Helsper (2015) argue that limited access to ICT infrastructure may hinder individuals' proficiency and development in making use of digital resources for the achievement of specific objectives. While limited access in regional and rural communities has been well recognised in relevant literature and policy documents, there is also a serious gap in ICT access and use within cities (Holloway, 2005). This study reveals that access barriers exist within cities due to constraints of technical infrastructure and service options provided by internet service providers. Under such circumstances, some interviewees needed

to find alternative connections (e.g. mobile internet networks), which were often not better options than the connections available to others (e.g. a fixed connection), and involved higher cost issues due to different capacities. These factors caused their usage to be compromised.

It is believed that many Australians have “reasonable” access to the internet, and that a small percentage living in rural and remote Australia has very limited access (Thomas et al., 2016). However, this study shows that the level of reasonable access chosen by users is not always adequate and does not always allow users to make full use of the internet to satisfy their needs, instead only allowing access to some services, which is still regarded as “having access”. Recently, the *Canberra Times* reported on the inaccessibility of fixed line connections, which are generally believed to be more reliable and reasonable in terms of data usage than mobile internet networks (Le Lievre, 2017). Access challenges in some regions may not be prominent due to the higher availability of internet infrastructure as a whole in well-connected city neighbourhoods. This is well reflected in a resident’s comment in this news article (Le Lievre, 2017), “you almost assume in this day and age, in a capital city in a suburb as old as this that you could access some type of internet.” Philip, et al. (2017) argue that the extent, type, reliability and quality of digital infrastructure varies, which have a profound effect on the ability of internet users and their online experiences.

6.2.2. Skills: concerns about online security and limited skills

Digital literacy is an important dimension for measuring the digital divide among populations (Bélanger & Carter, 2009; Van Dijk & Van Deursen, 2009). Further, it is even more important to extend engagement in activities online (Ferro, et al., 2011; Mossberger, et al., 2003). The observations of limited users in this study clearly show that limited digital skills are a critical barrier to being able to perform activities online. In particular, two key issues preventing limited users from deepening the application of the internet in their daily lives emerged: limited technical skills, and a concern about and limited capability to handle online security. This issue surrounding digital literacy is related to the empowered use of ICT.

Digital literacy is closely associated with the extent of use in terms of both depth and breadth (Ferro, et al., 2011). In particular, Ferro, et al. (2011) suggest that technical skills acquisition is crucial to being able to engage in more activities online, which is consistent with the observations of limited users in this study. Many limited users in the interviews found it challenging to comprehend the different forms of software and applications that must be both

installed to access digital content and services and further upgraded to retain usage. With rapid improvement of technology, the internet being faster and more complex, and thus in many instances costly or requiring necessary upgrades, requires users to keep up with various applications and devices (Newman & Gurstein, 2016). As a result, the basic level of digital engagement is much higher than it was a short time ago (Helsper, 2008) and technical skills acquisition is becoming more crucial to being able to perform more activities online (Ferro, et al., 2011). This was also observed among limited users in this study.

Along with evolving computer and internet technology, users are often required to upgrade their computer and software programs to maintain their usage and in turn purchase new technologies. Outdated hardware is recognised as one of the barriers to access maintenance (Gonzales, 2016). However, those who are less familiar with digital technology experience considerable difficulties adapting to new systems and applications, which in turn can contribute to increasing feelings of incompetence and further cause negative perceptions of technology. Nansen, Wilken, Arnold and Gibbs (2013) argue that a sense of the difficulty of technology among users is common and compounded by rapid versioning of digital technologies. Many learners feel that technology is too complex for them to fix if it goes wrong (Georgiou, 2004). Therefore, when they encounter problems with their devices, there might not be anything to do but replace their devices with new ones, as is recommended by sellers when advice is sought. Furthermore, Green (2006) has found that novice users tend to deem any difficulty they experience with technology as their own fault or as resulting from their own incapability, expressing “I am not capable”, or, as in Jackson’s account, “something is wrong with me”. Being unsure of their own capability closely related to a lack of confidence, particularly in internet security, as mentioned earlier, which appeared to result in extended non-involvement with financial transaction services (see p. 112).

Rahman and Quaddus (2012) reveal that the perceived ability to operate technology is a critical factor in technological change decisions, influencing willingness to try out new digital devices. In this sense, use of the internet for finance-related activities like shopping and online banking is somewhat challenging, as it requires a willingness to use it under unfamiliar conditions (Cushman & Klecun, 2005). In this study, while many limited users were well aware of online safety and the risk of computer viruses, their perceived capability to technically handle these issues was considerably low, resulting in limiting further engagement online to routinised activities like emailing and information searching. In line with the findings in this study, Walton, et al. (2013) highlight the importance of digital

literacy focusing on the development of knowledge of how to safeguard personal information and ensure a reduction in the risk of computer viruses, which is often not included in digital literacy training.

Walton, et al. (2013) emphasise that digital literacy is about possessing competency in the use of digital tools, which does not merely mean cultivating an understanding of digital technology, but also using digital technology to achieve everyday tasks and goals. Nansen, et al. (2013) have found that those who are digitally literate routinise their communication and transactional activities online in an effective way. Wider internet skills increase the likelihood of capital-enhancing activities online (Helsper, 2008; Zillien & Hargittai, 2009).

The acquisition of skills and knowledge tends to focus on the presence or absence of personal skills, not considering other salient factors surrounding one's limited engagement online. Observations of psychosocial barriers resulting from concern about the rapid development of applications and security issues deny the foundation upon which literacy might be built. A lack of confidence in keeping up with the rapid development of technologies and handling technical issues are all relevant.

6.2.3. Relevance and awareness

A lack of significant use of ICT, which is due to a lack of relevance and awareness, is one of the critical factors hindering users from extending their use of ICT. It is notable that most limited user interviewees are curious about how online content and functions might be useful in their lives. Awareness regarding the benefits of technology is crucial due to its impact on engagement with technology as a motivational factor (Melenhorts, Rogers & Bouwhuis, 2006). A lack of perceived benefits can lead to a rejection of technology use (Morrel, Mayhorn & Bennett, 2000).

Meaningful use of technology is closely related to contextual factors, which include individuals' personal and social circumstances. Selwyn (2006) suggests in his qualitative study that perceived lack of relevance or fit with current life circumstances are reasons behind low levels of technology use. Likewise, Seale and Dutton (2012) also note contextual factors, such as "life-fit", as being critical factors influencing one's technology use (p.318).

Selwyn (2004) argues that many adults seem to be creating a use for technology rather than it filling deficits in their lives. Similarly, in this study, many interviewees expressed a belief

that use of the internet and computer is becoming a necessity, even though they did not articulate the benefits they gain from it. For example, Facebook use was one of the most mentioned activities of internet use among interviewees, and their reasons for wanting to use Facebook were not different, mainly being mentioned as “everyone uses it”. This suggests that the perceived needs of society rather than the individual may shape one’s use of the internet and computer (Selwyn, 2003), which is often observed among those who start learning and using the internet. However, this study shows that meaningful use of the internet and computer may be more driven by individuals’ own needs, as these motivate novice users and learners to continue and further extend their engagement. In other words, individuals may need momentum that can drive them to move towards engagement on their own terms and for their own purposes (Katz & Gonzalez, 2016). This is more everyday needs related, whereas initial social needs (e.g. a mobile phone and Facebook) drive them to start.

For those who use the internet and computer in a limited way, momentum is critical to increasing the relevance of the internet and computer in their everyday lives and fills deficits in completing daily activities in more efficient and effective ways. Helsper (2016) suggests that benefits can be recognised by observing others who appear to gain benefits from technology use, particularly under similar conditions, which can be opportunities for raising awareness of the social resources available. The actual implementation of internet use in terms of real opportunities in everyday life are important to increasing the relevance of the internet (Van Deursen, Helsper, Eynon & Van Dijk, 2017). However, it is worth mentioning that knowing how things can be done better through the employment of technologies is not always observed and easily recognised by everyone as often observed in this study. This can be social and cultural resources for informed choices which are made by individuals in accord with their preferences and needs. The results of this study further support the idea of enhancing the relevance of ICTs, showing that most limited user interviewees were not given adequate opportunity to make use of ICTs relevant to their own needs.

Technological awareness and an understanding of the relevance of technology are not entirely up to individuals but rather the social networks and communities in which they can observe, experience and confirm technology’s utility. Technology is socially shaped (Lawson, 2007), such that the social context in which individuals find themselves is crucial to locating the added value of technology use. Without stages of awareness in such contexts, individuals often have the perception that they cannot and will not benefit from ICT-related developments (Klimaszewski & Nyce, 2009). Therefore, once individuals adopt technology,

their ongoing practices and extended engagement may depend on the extent to which technology is accessible and recognisable to individuals, in particular in terms of whether it is perceived to benefit the social groups to whom social resources are unlikely to be accessible.

6.2.4. Latent barriers to becoming effective and empowered users

Sánchez-Valle, Abad and Llorente-Barroso (2017) conclude that the digital divide results from different levels of access to and use of ICT in different social settings. Hilbert (2011) also emphasises the importance of defining the digital divide in terms of the effective adoption of technology and its impact. This study further supports the literature, suggesting that access to and usage of ICT does not always entail its effective adoption beyond the mere consumption of content and service. Users have reasonable access, skills, capabilities and positive attitudes towards technology, which are deemed to be required components of adoption (Hilbert, 2011). However, the limited users in this study demonstrated that they still encounter a range of barriers to becoming effective and empowered users before benefiting from being digitally enabled.

Skills and capabilities remain critically important, and most user interviewees had encountered technical issues and difficulties in handling technology. However, it was often observed that such obstacles remain unaddressed and culminate in decreased confidence, limited usage and further negative perceptions of technology. This demonstrates how a lack of prompt and ongoing assistance and support can significantly influence those who are less skilled. The efforts to overcome such technical barriers were well reflected in the observations of many of the user interviewees in this study, who had sought out support, including in the form of paid courses and training programs, to increase their skills and knowledge. However, this study also raises an inherent factor explaining non-use: a reluctance to ask for help, which was observed as a critical issue, especially for limited users seeking to broaden their use of the internet in more effective and efficient ways after noting their deprivation compared to other skilled users, such as trainers and family members. Experiences seeking help and learning opportunities were not always effective, and even sometimes rather discouraging.

Cushman and Klecun (2006) point out that ICT curricula largely focuses on technology itself, and does not cover its intermediated roles in assisting to complete tasks, nor enable individuals to make use of it on their own terms. These elements were in fact largely missing

in the training courses and programs taken by interviewees, which did not play a significant role in increasing the relevance and awareness of technology for novice learners. Whitworth, Garnett and Pearson (2012) highlight the importance of the role of institutions involving not just “technical activities”, but also “raising the awareness of community members and distributing skills”, and further “making connections and thus creating new resources” (p. 401). The extended notion of support and assistance is crucial for ensuring that these resources enhance digital inclusion.

The findings from interviews with limited users confirm that a gap exists between varying contexts of connectivity. The gap may not be curtailed unless sufficient social resources (infrastructure) include not only technical support and assistance, but also provide opportunities to discover needs on individuals’ own terms and the tangible outcomes of being digitally empowered.

6.3. Digital exclusion in everyday life

More routinised, evolving and accumulated

The interviewees that participated in this study had clearly witnessed the ubiquitousness of ICTs in society. Observing not only that the people around them were using computers and little gadgets such as smartphones and tablet PCs all the time, but also that their social activities were increasingly ICT-mediated, such as when it came to keeping in touch and communicating with others, seeking information, educating children and using and purchasing service and products, they were aware of increasing changes surrounding ICTs in society. The interviewees revealed that such experiences of change influenced their social activities in many ways. For example, they had come to understand the need to use the internet when reporting a car accident, keeping up to date with changes to parents’ community meetings, registering their children for therapy courses, enrolling their children at school, claiming Medicare benefits, completing the Census and entering promotional events. Such social activities are neither special nor infrequent cases, but are instead routine events that can occur anytime in individuals’ everyday lives. This indicates that ICTs are very relevant to the everyday lives of non-users, even though they do not use them.

It is evident that the circumstances that lead to digital exclusion – the non- or limited use of technology – result in non- and limited users’ exclusion from many aspects of their daily lives, such as from socialising, parenting, engaging in information flow, enjoying culture

sharing and participating in markets. It is notable that these exclusions occur not only among non-users but also among those with limited or partial use of technology. Not being able to use digital communication tools, such as email, directly contributes to a lack of connectedness and can lead to eventual exclusion from networks. This is even more critical when it comes to social networking activity, through which social resources (such as social capital) are formed. Social resources, in turn, can be accumulated by continuing engagement with social activities online (e.g. advice and support) (Ellison, Steinfield, & Lampe, 2007; Pew Research Center, 2015), as well as have the effect of increasing the relevance of technology for users.

Furthermore, by not engaging in digital activities as information consumers or providers, non- or limited users are likely to be excluded from the flow of always-on information that is generated, modified and updated in real time. This not only means missing information, but also contributes to a lack of sense of belonging, a sense that could otherwise be provided by a digital culture of sharing. In this regard, Ragnedda and Mutsvairo (2016) recognise that, in a postmodern society,

...to be a recognisable member of a community, citizens/users must not only be a part of the (online) community (access to the digital realm) but also be active members of the aforementioned community (having digital skills)... (p.111)

It is argued that securing greater internet penetration will not eliminate digital inequality on its own, but instead create a new kind of inequality among people and groups (Durieux, 2017), potentially shaping their life chances in multiple ways (Ragnedda & Mutsvairo, 2016). The life chances in question here may not only be relevant to those who need to improve their quality of life economically, but may also have the potential to further the lives of all citizens who have a right to full membership of a community. The interview results in this study illuminate this by revealing how non- and limited users feel about being digitally deprived in a connected society. The interviewees had not only experienced exclusion from digitalised services, resources and social systems, but also from their society as a whole, both as a result of lack of access to technology and because of deprivation when it came to participating in social activities, including consumption, sharing, and communication, all of which shape membership in a community.

The idea of participation in society rather seems to focus on productive activities, such as transactional activities, the use of services, access to resources, information seeking and communicating. However, membership in a society is not confined to such activities, instead

extending to all kinds of activities, including leisure. For example, Ragnedda and Mutsvairo (2016) discuss the notion that the experiencing and consuming of leisure can be distinctive components of social inequalities that influence and exacerbate digital inequalities. They argue that individuals excluded from the digital realm are also excluded from the context in which their identities, sense of belonging and community membership are created.

Citizens/users who do not have the opportunity to access the online environment are excluded from a socialising place, which potentially provides the grounds for learning social norms, obtaining information and sharing emotions and experiences. Further, citizens who have digital access but do not have the abilities, skills, motivation, awareness or understanding of the online rules are further marginalised (p.112)

The exclusion from socialising and culture of sharing identified in this study illuminates Ragnedda and Mutsvairo's idea of exclusion from digital leisure culture. Many interviewees in this study expressed their needs for online communication tools, particularly social networking sites, in which people share and communicate via different activities, such as posting, commenting and sharing content. Non-users had started to recognise that not only were they missing out on content shared in the online sphere, but also that they were deprived of a sense of belonging in their social networks, including family. This indicates that it is the experience of connection and presence online that provides a sense of belonging to users (Cuervo et al., 2017). Furthermore, content and information shared in the sphere can also generate values, such as social support (Quan-Haase, Mo & Wellman, 2017), and extend new cultures, such as collaborative consumption (Belk, 2013) and activities (e.g. social movement) (Van Laer & Van Aelst, 2010).

For Layla, participating in an online community for parents on Facebook helped her find resources that she would have missed if she did not use the internet. This was particularly the case as she was a single mother who may not have been able to physically participate in face-to-face social activities, which are otherwise used as a primary way of seeking and sharing information and resources. This case supports the idea that less privileged people may be able to improve their access to social and cultural resources by using the internet, which is largely regarded as a benefit that can be accrued from digital engagement. On the other hand, Rachel's case illuminates the new exclusion groups emerging in today's digital era, specifically those who do not use the internet despite their access to ownership and who may confront new barriers to accessing social and cultural resources. This sort of deprivation is increasingly of concern given the existing concept of excluded groups defines them as

consisting of individuals in more marginalised and disadvantaged social and economic positions.

While socioeconomic factors have been largely spotlighted as determinants of the digital divide, emerging groups who are digitally excluded regardless of their social and economic status have received little attention. Therefore, little is known either about the contextual factors in which people continue to remain offline, or resulting experiences of exclusion in their everyday lives. Exclusion may not be as significant as it was before, when individuals did not even recognise their deprivation; however, as more and more people have become involved in a culture of sharing, intangible social and cultural resources have been accumulated and are now recognisable. The growing recognition of deprivation observed among interviewees in this study implies the evolving nature of digital exclusion.

As services and information are increasingly delivered online, it is unsurprising that non- or limited users can be excluded from any sector of society, including education. In particular, educational administration systems are becoming increasingly web-based, such that digital exclusion can lead directly to social deprivation, whereby parents lack the support or opportunity to fulfil schools' requirements of them. The case of one interviewee, a school mother and non-user of the computer and internet, clearly shows that non-use impinges on parental engagement, children enrolment, communication with teachers and the provision of feedback, all of which are currently facilitated by a web-based system. This leads to a reduced level of social resources, which can cause disparities in the quality of parenting and education (Hollingworth et al., 2011). Given that parental engagement (which includes parents' involvement in schooling) can lead to better student academic attainment (Emerson et al., 2012), it is essential for parents to be able to employ digital tools to achieve effective and efficient interaction with teachers and engagement with digitalised school administrative systems. It is notable that a regular internet user interviewed in this study welcomed the introduction of a digital system to inform parents of children achievements and problems relating to school activities because such a system facilitates more opportunities for communication with teachers.

It is clear that while some are advantaged by the efficiencies and conveniences of technological development, those who do not have access to such technologies may experience disbenefit and become even further marginalised. Social exclusion refers to the "restriction of access to opportunities and a limitation of the capabilities required to capitalise

on these opportunities" (Hayes, Gray, & Edwards, 2008, p. 6). Ultimately, social exclusion is about a lack of "connectedness and participation" (McDonad, 2011, n.p.), which is a phenomenon exacerbated by technology.

Increasing exclusion from markets among non- and limited users is also observed in the interview data. Stroud (2012) has attempted to identify the characteristics of "the digitally excluded consumer", suggesting that a significant group of people who are not connected to the internet are excluded from customer services like inquiries, information seeking or after-sales. Exclusion from markets can affect individuals' everyday lives significantly given the increasing prevalence of web-based service delivery systems in commercial and public sectors (e.g. e-government). Stroud (2012) highlights that cost-saving digitalised systems can be inaccessible to those who most need access to services, and even more so when it comes to mobile-based applications designed for customers, such as social networking sites.

Internet access does not automatically translate into greater access to information and resources (Hilbert, 2011). Indeed, some novice users in this study reported difficulties dealing with different platforms and functions online. Online activities such as information sharing involve a range of skilled tasks, including posting, uploading, replying, linking and attaching, all of which are increasingly difficult tasks for non-users or novice users who do not have technological familiarity or basic skills. As technology evolves, increasingly high-quality and customised online platforms emerge and existing platforms are continuously updated. As a result, the exclusion experiences of non- and limited users are also inevitably accumulated, unless they experience ongoing support and assistance.

Individual stories of exclusion in everyday life raise the multidimensional reality of the digitally excluded. Silverstone (2017) mentions the significance of everyday life as a context for acceptance of or resistance to new communication and information technologies, highlighting "everyday life is an empirical domain in which our relationships to information and communication technologies are worked out and worked on"" (p.7). The exclusion experiences of non- and limited users in everyday life show the changing nature of digital exclusion, which is now more individual, evolving and accumulated to reflect the dynamics and complexities of individuals' lives.

Chapter 7 Conclusion

7.1. Implications for digital inclusion policy

“Digital inclusion for all” is now a slogan that many governments make considerable efforts to put into practice, particularly in countries with high internet penetration, such as Australia. Government digital inclusion policy is no longer solely focused on connecting people, but instead also aims to ensure that all Australians are included in digital innovation and opportunities. In July 2015, the government established the DTO (former DTA), whose mission is to lead the transformation of government services to deliver a better experience for Australians.

Our opportunity is immense. We think Australia can become the best in the world at delivering government services.
(Paul Shetler, Chief Executive Officer, DTO)

However, there are still a significant number of Australians who identify as non-users of the internet and computers for various reasons. There is growing concern that those who do not have access to technologies may have become further marginalised following advancements in digital technology, such as is expressed in Thomas’ (2016) comments below.

... Twenty years ago, the costs of not being connected to the internet were small. They are now substantial. As crucial services and knowledge resources increasingly move online, the risk of a stratifying internet is that the benefits of connection are concentrated among those who are already well-placed. Digital exclusion then becomes an increasingly serious problem for those who depend on support and services most. (18 November 2016)

Although there are growing concerns about the digital divide deepening, differences in internet penetration across the population continue to narrow in Australia (Ewing, 2016; Newman & Gursteinon, 2016; Perlgut, 2011). Nevertheless, it is clear that national policies in bridging the digital divide have not been entirely successful and that Australia still suffers from a huge digital gap. For digital inclusion policy to be effective in Australia and elsewhere, it is important to identify from the ground up why some individuals continue to remain offline, as well as the nature of exclusion experiences in their daily lives and how we can mitigate these. While these are the aspects that should be targeted by the government, its policies have until now been heavily focused on supply and paid little attention to empirical evidence on how and why people use or do not use available technologies. Instead, a more nuanced and refined lens is needed to see what is happening in everyday life.

This study was conducted to provide insights into digital inclusion from the perspective of digitally excluded members of society. It is worth noting that those who identify themselves as non-users are increasingly difficult to recognise in a society that is more connected than ever before, resulting in their voices hardly being heard in many realms. This should be carefully taken into account when studying digital exclusion in particular so as to elicit an understanding of the deep-rooted factors behind their extended non-engagement.

The latent reasons behind the non-use call for a broader approach to understanding non-use, which goes far beyond an individualistic explanation that predominantly focuses on micro-level factors, such as motivation and enthusiasm, as well as socio-democratic variables.

While this individualistic approach has contributed considerably to defining the individualistic characteristics associated with non-adoption, it has been limited in capturing the more complex circumstances of digital exclusion, in which different social and contextual barriers are intertwined and thus are not explicitly captured. Furthermore, it has also been limited in understanding the changing nature of digital exclusion as societal environments and social relations change over time. Social and circumstantial factors need to be considered when designing and implementing effective policy interventions. Digital divide policies often view technology adoption narrowly, focusing on moving those who remain offline to the online sphere. This has largely led to supply-focused efforts, rather than on understanding the circumstances and limited social support or encouragement that this thesis has identified as the main causes of digital exclusion.

This does not mean that supply-focused government interventions have been entirely misguided or ineffective in addressing digital divide issues. The increasing availability of communications networks and devices across nations has been widely emphasised in literature on ICT policy as very important to digital inclusion. However, connectivity alone is not enough to ensure that users are able to benefit from internet use, and this has not been adequately taken into account from a policy standpoint. As a result, there has been a failure to effectively respond to changes in the digital divide and emerging digital exclusion as society becomes increasingly digitally integrated, nor has there been success at uncovering the individual and contextual factors relevant to such changes. For example, while the digital literacy aspect has long been recognised in policy documents as key to addressing digital divide issues, more attention and resources have been given to increasing digital skills at the institutional level (e.g. schools, universities and workplaces) than at the individual level, in particular among those who are digitally un- or less able. As a result, many initiatives have

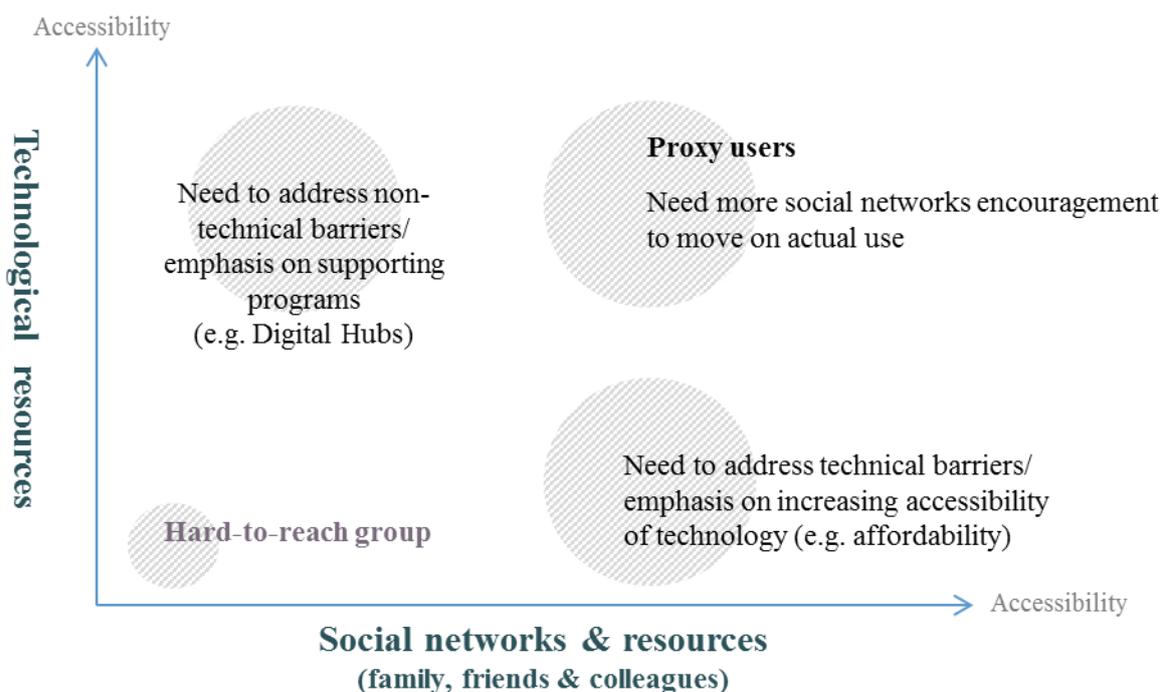
not been adequately effective in ensuring digital inclusion and have failed to reach out to those among the digitally excluded who are in need of support programs.

Given the significance of social support and encouragement when it comes to digital exclusion, it is necessary to target these aspects when seeking to solve this issue. Therefore, this study emphasises the importance of social resources to digital inclusion outcomes and proposes that there are different dimensions that can be taken into consideration when addressing technological and social support constraints, both of which contribute to non-engagement.

7.1.1. Dimensions of the digitally excluded

Figure 7.1 presents different dimensions of the digitally excluded in terms of their technological and social support resources. Technological resources (e.g. access, data and devices) are fundamental. The first axis represents the degree of technological resources available, which is closely related to type of household, residential area and family members. The second axis is the spectrum of social resources, which represents social support from family, friends and colleagues, as well as community and society as a whole. The extent of one's social resources varies depending on socioeconomic status, neighbours and social activities.

Figure 7.1 Dimensions of the digitally excluded



The first dimension on the left indicates non-users for whom technological resources, such as access and devices, are highly available, but for whom social network resources, such as friends and family who can assist and encourage, are limited. This group's non-engagement likely results from experiencing a lack of assistance, particularly in terms of immediate and ongoing support. The first dimension on the right indicates non-users who have both high technological support and social resources, meaning this dimension mostly consists of proxy users. Members of this dimension are more likely to need social encouragement to advance actual use. From the observations made in this study, it would seem this group is more likely to use public resources and continue learning as a result of access to resources, both in the form of technology and social support.

Technological barriers are more likely to be significant for those who belong to the second dimension on the right. Affordability issues may contribute to their non-engagement. In particular, elderly people living alone at home may belong to this dimension as a result of having relatively lower demand for the internet. Lastly, the second dimension on the left, the "hard-to-reach group", which lacks both technological and social resources, is less likely to be addressed in the current digital inclusion programs. Training facilities provided by public libraries and centres are largely based on an inbound approach, which does not reach out to potential visitors, in particular digitally excluded members that are more likely to be passive in relation to technology due to their lack of technological and social resources.

It is important to understand the different individual circumstances that may determine the degree of resources accessible. Categorisation into different dimensions provides a guide which can help better understand the digitally excluded by emphasising both technological and social support resources, which are equally crucial to digital inclusion. These resources are an essential prerequisite to digital enablement, which is in turn a vital condition for digital inclusion.

7.1.2. Building social support: ongoing and informal

As mentioned above, this study considers social support as not confined to individual social networks, but, more importantly, to extend to the supportiveness of the community and society in relation to digital engagement. What is important is to create supportive resources which help and assist the digitally excluded to be digitally enabled by defining the exact kind of supportive practices that are the most effective or successful in promoting digital inclusion

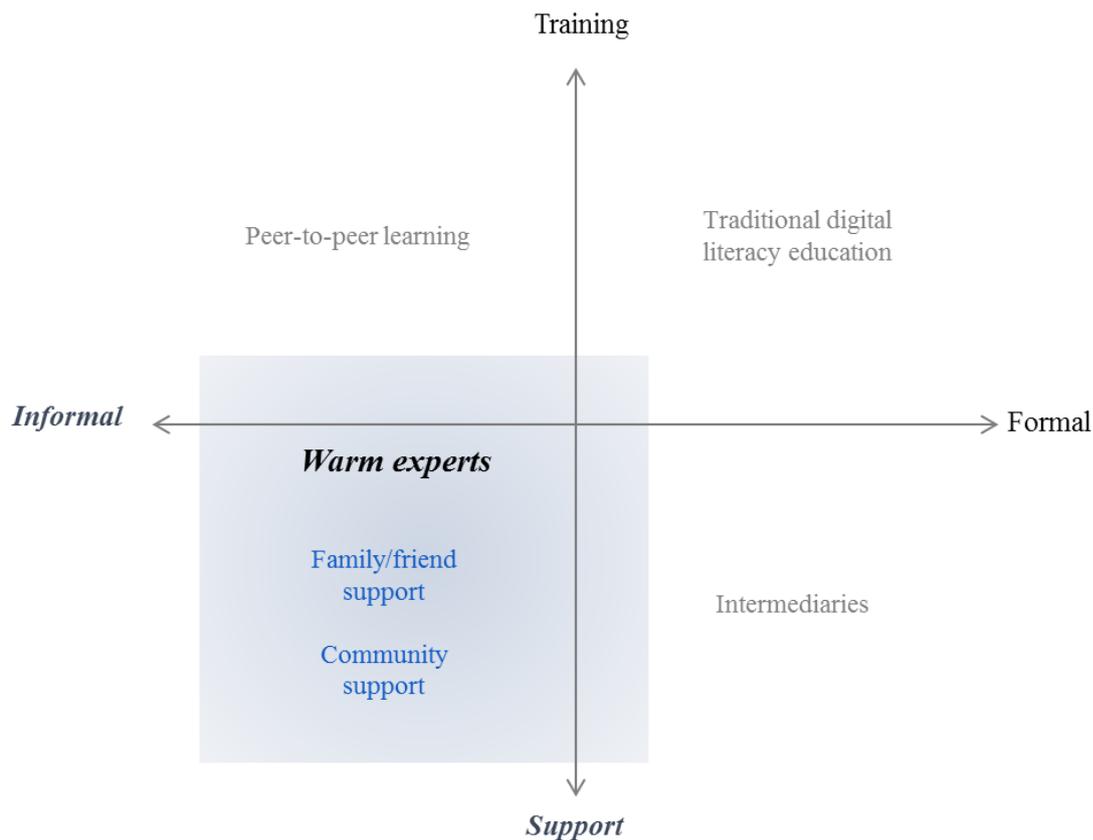
of marginalised learners, who largely belong to the “hard-to-reach” dimension. Technological resources have been recognised as a fundamental prerequisite for ICT adoption and as an element that can be addressed by the building of infrastructure and the provision of required devices; however, there has been little effort to create supportive resources for the whole of society. Existing training programs and public access facilities are closer to the concept of provision than they are to generating social support resources. This may be because of the inherent design of such programs to push learners to pursue goals (Roberts, 2011). In other words, rather than creating new, more effective experimental digital inclusion practices, these programs are limited to providing fixed training, such as in basic computer and social networking site skills.

The question then becomes how to generate social support resources. In terms of the social network resources observed in the interview data, there are two critical components of social support: continuity and informality. Learning from friends and family was the most commonly reported digital engagement method among non- and limited users participating in this study. Informal and individual types of seeking help are immediate and contextual and highly effective when utilised adequately (Park & Lee, 2017). Skilled family members and friends play the role of “IT supporters” for other less skilled people, which influences their continuing and active engagement in online activities, as they are enabled to resolve technical problems that would otherwise persistently frustrate them. Furthermore, family members and friends not only help sort out technical problems if needed, but also encourage users to be confident by recognising the learner’s situation and interests, which is a key factor in motivating them to use technology. For example, Anna’s approach to encouraging her husband, Samuel, to start learning how to use the computer and internet was particularly effective, as it was based on a recognised motivation for use in the form of Samuel’s interest in new cars.

Park and Lee (2017) argue that there is no linear way of learning digital skills and literacy, and users have different approaches, suggesting a typology of different types of learning models. This typology introduces two important components of how a person acquires digital literacy: formality of teaching and method of learning. Four different types of learning models are identified in this framework: traditional training, intermediaries, structured peer-to-peer learning, and family and friends support model, which are categorised by the spectrums of continuity (training vs support) and informality (informal vs formal).

This study in particular notes the fourth type, family/friends support and proposes to extend it to the concept of warm expert (Bakardjieva, 2005), which is a type of learning as nexus of informal setting and support [Figure 7.2].

Figure 7.2 Types of social support



* Adapted from a typology of digital literacy learning in “Effective Informal Support Models of Digital Literacy,” by Park, S. & Lee, J. (2017)

The warm expert form of learning is characterised by: learning in an informal setting; ongoing and immediate support; a focus on the problem at hand; and solving the problem together. In this study, the positive effect of the warm expert learning mode on encouraging and motivating non- and novice users to engage with the internet and computer was observed in Louise’s accounts of her learning experiences with a volunteer trainer (see p.150). Park, Burford, Lee and Toy (2016) observe the crucial effect of individual and contextual approaches to training participants, particularly those who do not have prior experiences of internet and computer use, on ultimate successful adoption. Park (in press) identifies that

continued dialogue with the trainer is one of the essential components required to achieve digital confidence in learning. This may be because such interactions help trainers understand the contexts of trainees' use, as well as the way that the internet fills deficiencies in their daily lives (Cushman & Klecun, 2005).

However, the concept of the warm expert may not be easily practiced in reality due to the demanding nature of the role, which can challenge those who are tasked with providing training programs and assistance in public centres and libraries. Therefore, how the warm expert model can be effectively adopted is a critical consideration for digital inclusion practice. An interviewee of this study provides a clue as to the nature of warm expert practice. Clara, who described herself as moderately using the internet and computer in a variety of ways, outlined how she moved from being a non-user to a skilled user in her interview. Of particular interest was one story she shared, in which she applied for a government public grant to support community development after having the idea of teaching members in her complex how to use computers. As the only person in her complex using a computer, she wanted to encourage her neighbours to use the internet and computer after observing the problems they faced in their daily lives as a result of their non-use. Therefore, she put together a proposal based on data from around her complex.

Her idea to encourage non-users to use the internet and computer was based on her observation of her non-user neighbours, and her desire to help connect them to the internet. This example provides insight into digital inclusion. Her idea of "community-directed digital development" aimed to include those who were likely to have limited personal and public resources and were largely invisible in terms of digital inclusion practice. Indeed, public training facilities, such as libraries and community centres, tend to be driven by individual voluntary participants rather than by actively approaching the digitally excluded who are isolated from them. In this sense, social support and encouragement from close social groups, such as neighbours and peers, who are likely to be involved in individuals' everyday lives in many ways, can compensate for a lack of resources and are advantageous in providing immediate and continuing assistance and learning opportunities in informal settings.

However, unless this willingness is systematically organised and managed, it is highly unlikely to be sustainable. Rather than relying on the goodwill and efforts of individuals, societal measures must be in place. Such measures might include training programs for warm experts, incentives, and support in the form of resources, such as devices, connections and

materials. Clara's grant application was not successful, which may have important implications for policy, highlighting a legitimate type of training that governments need to begin recognising. Policies should intervene to promote the sustainability of the warm expert learning mode, especially by offering supporting programs to warm experts.

Also, the warm expert learning mode can assist in the context of all end-user contact points, such as public centres, schools, government departments and service providers. What is important to consider is not where warm experts are but how the warm expert learning mode is practiced, particularly in terms of whether it is based on the features mentioned above, as the combination of these factors can ultimately lead to social support as a resource for digital inclusion.

Social support should also be measured to monitor the extent to which society is supportive of citizens being digitally enabled. In order to measure digital inclusion in a society, the degree to which technical and social support resources are accessible is a crucial index. Future research needs to consider this on a larger scale. Important considerations in measuring social support involve not only defining the obtained resources one may have, but also how such perceived social support is accessible, sustainable and affordable, as well as at which points it can be practiced to be effective.

Digital inclusion has previously been associated with helping people acquire the most basic internet skills to help them get online and see the benefits of doing so, and with leading them on the path to becoming more active users. Many people need ongoing support. To function in an increasingly digital world requires more than being able to surf the internet. To secure the benefits of being online, individuals need to be able to communicate effectively online, find and evaluate what they are looking for and safely share personal information, whether they are undertaking a public service transaction or buying products at reduced prices online. In order to achieve digital inclusion for all, ensuring everyone can have support from their societies and communities when required is equally as important as ensuring technology is accessible for all. This has fundamental policy implications, suggesting what governments should now focus on and where they should input more resources, as well as highlighting the need for a shift in focus when it comes to digital inclusion practice.

7.2. Theoretical implications: relative digital deprivation

Helsper (2016) proposes a new theoretical frame adopting relative deprivation theory to better understand the issue of digital exclusion (or “digital inequality” as it is sometimes referred to), which is called Relative Digital Deprivation Theory (RDDT). The concept of RDDT emphasises the relative nature of digital inequalities and forces researchers to look closely at changes in daily settings and how such environments influence people’s ICT perceptions and behaviours. The findings in this study provide empirical evidence to support Helsper's concept of RDDT, which can be of use in better understanding the mechanism of relative digital deprivation and its implications for further studies.

In the interviews undertaken in this study, experiences of “being excluded” were accompanied by several common feelings: that of being left behind in society, missing out on resources, pressure to learn to use technology, a sense of disconnection from others, and being ineffectual. These sentiments resulted from individuals comparing themselves with other members of society who make use of ICTs and the changed social environment. Comparing themselves to others made them realise that they were missing opportunities to access information and resources. This study has identified such a realisation of missed opportunities as manifestation of the concept of Relative Digital Deprivation (RDD).

Self-comparison with others triggers individuals’ recognition of deprivation. This comparison occurs very close to their daily lives because referents are all around them, such as in the form of family members, friends, neighbours, acquaintances and even trainers. Referents mainly appear as those who have contact with the individual, but it was also observed that referents can be in the form of random social groups, such as young people or even the individual’s perception of his or her past or future self.

Non- and limited use of ICTs itself does not cause a feeling of deprivation. Instead, it results from recognition of a lack of the opportunities that are seemingly accessible to other members of society other than themselves. Such individualised negative experiences have a significant influence. For example, the “hesitating to ask” that is often observed among participants can be a reaction to perceived relative deprivation, as digital engagement is increasingly becoming a social norm.

Cuervo and Menéndez (2005) earlier recognised the relative nature of digital exclusion, arguing that ICT use depends greatly on the degree of development in the information society.

As a consequence, we can find situations where ICT use becomes increasingly sophisticated while a specific individual, still being user, could only be able to carry out a “rudimentary” use, thus suffering a certain digital deprivation (p.7)

Over a decade ago, Cuervo and Menéndez speculated that relative digital deprivation would increase as society becomes more digitalised. A surprising number of the elderly interviewees in this study felt left behind by not being able to use the internet or access a competent user, and also experienced some pressure to use/start using the internet and improve their abilities or skills related to the internet and digital devices. It is somewhat surprising in light of the fact that digital competency for them may not be as necessary in their daily lives as it is for the working age cohort or young job seekers. This may reflect the research location of this study, which is one of the most wired regions in Australia. Those who live in neighbourhoods with greater levels of internet adoption and digitalisation may be more likely to perceive their relative deprivation. Additionally, it was observed that relative deprivation has been increasing over time and that many individuals have considered the need to become users in the future, as they expect that digitalisation will continue.

The concept of RDD can help us to understand the underlying reasons for continuing disengagement online as it forces us to look at social circumstances and contexts which are different from person to person and from social group to social group. Furthermore, this relative approach ultimately leads us to consider today’s attitudes to the development of technology and innovation by encouraging us to question how changes are adaptable for individuals. In addition, this approach can provide some insights into why improved access and skills training do not lead to increases in engagement for a significant number of the digitally excluded (Helsper, 2016).

The tenets of RDD are summarised below:

- Perceived deprivation resulting from non- and limited engagement in ICTs is relative and social, and results from comparing oneself with others
- The more there is observation of other members of society using technology, the higher the perception of deprivation may become among non- or limited users

- RDD results from recognition of deprivation from opportunities which are seemingly accessible to other members of society other than themselves
- RDD will increase as society becomes more highly digitalised
- RDD can help us to understand both the underlying reason for continuing disengagement with the internet, and the emerging digitally excluded groups who are invisible in the digital divide framework that focuses on tackling the access gap

The interview study identifies new forms of digital exclusion and shows that more forms will continue to emerge as barriers to digital inclusion following advancements in technology. The ideas of effective use and tangible outcomes are new themes in digital exclusion policy and research, which can help find more effective ways of engaging and empowering users, and, by implication, contribute to better models of training, such as a typology of digital literacy learning (Park & Lee, 2017). Future research and policy should more greatly consider the diversity and variety of users and non-users, and aim to provide ground up solutions that can address the ever-changing new problems of the digital era.

7.3. Further research

A number of potential avenues for future research are suggested by the findings in this study.

It is necessary to explore the effect of relative digital derivation, particularly in terms of its negative influence on seeking social support. Given that a reluctance to ask for help was often observed among the digitally excluded in this study, it would seem that perceived relative deprivation may lead people to feel uncomfortable in seeking help with computers and the internet, but this is an avenue yet to be explored. Along with the negative effects of relative digital deprivation, exploring its relationship with other resource availability, such as human and social resources, may assist in refining the concept, such as by questioning whether there is any difference in relative digital deprivation between those who have access to necessary services and resources, namely proxy users, and those who do not.

A further area of research suggested by this work concerns proxies. This study suggests that proxy access can cause extended non-use due to underlying discouragement from proxies, however, exactly why proxies are not supportive is not evident and may require further research in the future. According to a recent research report on proxies (Selwyn et al., 2016), most proxies act as significant interpreters of the internet by deciding which online content

and services are relevant and appropriate, rather than acting as passive helpers that allow individuals to use the internet as they wish. This provides a clue to understanding the context in which proxies tend not to explicitly encourage non-users. Also, the report reveals that proxies are mainly involved in online activities that are perceived to include an element of importance and/or risk. This dutiful rather than pleasurable aspect of the proxy role may lead proxies to give little encouragement to new users to engage with the internet. Deeper exploration of the dynamics and complexity of proxy use can contribute to a better understanding of the contextual factors influencing the adoption of technology.

Another implication for research is the need to focus on non-adopters, particularly the elderly who live alone. Older people are more likely to live alone, and are predicted to increase in number by 3.7 million by the year 2026 (ABS, 2006). Older people can benefit from the use of technology. It is important for them to be able to stay in touch with family and friends (Slocombe & Craig; 2012). Boag et al. (2012) report that the number of baby boomers living alone is likely to increase as the cohort ages, and suggests that this group is also more likely to benefit from staying connected to family, friends, community and services through the use of new technologies. Furthermore, more recently, Quan-Haase, et al. (2017) found that older adults consider social support that is exchanged via digital media. They also found that such social support involves learning how to use technology, which provides opportunities to strengthen the networks of older adults. This study's findings, especially when it comes to elderly interviewees expressing their interest in learning how to use computers and the internet, particularly for the purpose of online communication such as via email and social networking sites, supports their findings.

However, this study further shows that elderly people who live alone are the most likely to belong to the digital underclass as a result of economic constraints that arise from a lack of social support resources and their lower demand for the internet, especially when compared to a household with children. A sporadic need for internet use (or limited usage) did not sufficiently motivate individuals to invest in home internet services (or plans with larger limits/speeds), even despite concerns about growing social demands and experiences of exclusion in their everyday lives. The cost issues experienced by one person households among the elderly are more complex and related to other individual circumstances, all of which combine to preclude them from having home access. An increasing number of older people are likely to be encouraged to stay longer in their own homes in the future. The internet should be able to help them live independently for longer, as they can shop, bank,

seek health advice and communicate from their own home. Further studies on digital exclusion in one person elderly households are needed to better understand the critical issue of affordability.

As discussed previously, the digital divide is not a static concept. This study also reveals that experiences of digital exclusion are very specific, highly individualised and may evolve and be accumulated depending on one's social circumstances. This suggests that there are still more cases of digital exclusion to be uncovered in socially and geographically different settings (Freeman, Park, Middleton & Allen, 2016) and larger-scale research into these issues is needed to gain a more detailed understanding. The issue of who is confidently and frequently online or not becomes more serious when we consider the current and, potentially greater, future role of the internet in education opportunities, research and democratic processes, and what this means in determining whose voices will be heard or silenced. Research on the digital divide and digital exclusion needs to raise issues which are still unaddressed and neglected by continuing to explore and identify the deep-rooted factors behind extended non-engagement and its consequence, the experience of digital exclusion in everyday life.

7.4. Limitations of the study

This study has several limitations that merit discussion and could potentially stimulate future research. These limitations relate to researcher bias, the study's sample and data collection.

In terms of documentary research, this study purposively reviewed the seven selected documents, including official policy documents, which explicitly provided text on the context, objectives and strategies of major ICT development policies. Although ten additional documents such as external reviews and analysis reports with information on the outcomes and impacts of policies, initiatives and policy recommendations were reviewed in order to fill gaps in the data, by relying on official documents, this study is limited in its ability to enlarge my focus and shed light on the issues being investigated. For example, inclusion of a wider range of digital inclusion policies and programs at other levels of Australian government, especially the state and territory level, would have been useful for providing comparison and context in understanding changes and development in digital divide policy.

Furthermore, this study is also limited in its ability to critically analyse policies by merely describing what the main emphasis was and how it was implemented in digital inclusion

programs. Again, this study intended to use a critical perspective to focus more on text explicitly written in official policy documents than the broader context of the policy process, which will be further investigated in future studies.

Although measures were taken to limit researcher bias, it is possible that potential bias may exist in the interpretations of the data collected. In addition to employing reliable methods of data collection, as outlined in Chapter 3, the researcher made continuing efforts to be aware of the possibility of researcher bias in an effort to curtail it. As a researcher and user of the internet, it was necessary to keep an open mind during the interviews so as not to lead non-user interviewees to respond in particular ways. A nuanced and sensitive approach to studying the non-user group, especially in terms of data collection methodology and data analysis, is crucial.

Another limitation of this study is that the homogenous sample lacks diversity, such that the results cannot apply to the entire adult population, and nor to young adults. The difficulty associated with recruiting members of the 25 to 34-year-old cohort in particular relates to the limited proportion of people (3.5%) in that age group who are non-users in Australia (ABS, 2016). Also, relative digital deprivation may be more significant in this age group because of the extent to which technology pervades young people's environments, and due to the high social expectation of digital technology use in such environments. This implies that it may be more difficult to reach out to young non- or limited users. However, this study suggests that non- and limited users in this age group are particularly worthy of study considering findings that show limited users may also be digitally excluded as a result of usage and digital literacy constraints. Exploring relative digital deprivation and experiences of digital exclusion among young adult groups might be another research avenue to be pursued.

Lastly, another limitation of this study relates to its use of one-time interviews. As described in Chapter 3, it was crucial to build rapport and trust with potential interviewees in the course of data collection, but this requires a period of time. Extended interviews ultimately allowed this study to elicit the underlying circumstances of non- and limited use of the internet and experiences of exclusion in everyday life. However, due to difficulties arranging suitable times, follow-up interviews with the same interviewees were not conducted. A second interview with follow-up questions particularly focusing on social support could have helped improve understanding.

7.5. Conclusion

Given the increasing importance of digital inclusion, many countries have developed digital inclusion policies that are particularly focused on the digital engagement of their citizens. The persistent digital divide and the fact that many remain offline, even despite the increasing risk of social exclusion, is a priority issue which many governments strive to address. National policies have often viewed technology adoption narrowly, focusing on changing those who remain offline, rather than on understanding the circumstances of digital exclusion. To fill this gap, this study was conducted to provide insights into digital inclusion from the perspective of digitally excluded members of society. In order to identify from the ground up why some people do not adopt technology despite increasingly experiencing social deprivation from a lack of connectivity, this study adopted an inductive approach, allowing it to focus more on emerging themes and concepts from the data without fitting into a pre-existing framework.

The 21 participants in this study contributed accounts of the circumstances surrounding their non- and limited use of the internet and experiences of social exclusion in everyday life, revealing the deep-rooted factors behind their digital exclusion. Each interviewee's story was different and based on his or her individual circumstances. The reasons for not using the internet were multifaceted and could not be explicitly captured by simply examining the accounts of interviewees. During the analysis process, however, the latent reason for continuing and extended non- and limited engagement was revealed as a lack of social encouragement and support/assistance.

Individual stories of exclusion in everyday life raise the multidimensional reality of the digitally excluded and the evolving and accumulating nature of digital exclusion. Non- and limited engagement impacted participants' lives in many ways, leading to their exclusion from different services and facilities, inability to participate in their community, inefficiency, and limited understanding of the potential value of technology in their lives. The social exclusion encountered by the digitally excluded not only related to digitalised services, resources and social systems, but also caused deprivation of a sense of identity and belonging based more on consumption, online activities, and online communities, which are factors that create fluid and innovative social relationships and a culture of sharing, and, in turn, shape membership in a society. Connection and an online presence have become important in identifying one's membership in the society and community in which one belongs and lives.

Australians today are surrounded by digital technology and required to use it more than they were in the past. As a result, digital exclusion related relative deprivation from services and activities, many of which the majority of the population would define as necessities of modern life, is becoming more significant. Furthermore, deprivation from opportunities which are seemingly accessible to other members of society other than themselves has now become more recognisable, exacerbating their relative digital deprivation. On the one hand, given it takes Canberra as its research site, it may be possible for this study to succeed in capturing the prominence of relative digital deprivation. This relative approach to digital exclusion puts more emphasis on understanding the local contexts in which individuals' daily tasks are fulfilled and their social relations are constructed than broader research contexts might. Furthermore, broader research contexts tend to encourage generalisations concerning the adoption/non-adoption of technology, whereas this study does not attempt to make such generalisations.

Further important insights provided by this study relate to the potential of policy intervention to increase ongoing and informal social support resources. This study suggests that a lack of social support resources impinges adoption of technology and provision of technical resources among the digitally excluded. Digital divide policies are largely focused on the digital literacy side of the issue and based on the assumption that the digital divide can be addressed if more people learn how to use and access computers and the internet. This has led to increasing training program provision across society. What digital inclusion policy should now focus on is the creation of effective social support resources, rather than solely on the distribution and delivery of existing training programs and information. How the components of successful and effective social support can be embedded into all contact points so that all citizens can easily seek help and assistance is a critical consideration for digital inclusion policy.

References

- ACT government. (2014). *Digital Canberra: A leading digital city: Action Plan 2014-2018*, Canberra, Australian Capital Territory: ACT government.
- Agius, A. (2013, September 24). Australia's Broadband History. Reckoner. Retrieved from <http://reckoner.com.au/2013/09/australias-broadband-history/>
- Akiyoshi, M., Tsuchiya, M., & Sano, T. (2013). Missing In the Midst of Abundance: The Case of Broadband Adoption in Japan. In M. Ragnedda, & Muschert, G. W. (Ed.), *The Digital Divide: The Internet and Social Inequality in International Perspective* (pp. 85-103): Taylor & Francis.
- Altheide, D. L. (1996). *Qualitative media analysis: Qualitative research methods*, Thousand Oaks, CA: Sage.
- Araque, J. C., Maiden, R. P., Bravo, N., Estrada, I., Evans, R., Hubchik, K., ... & Reddy, M. (2013). Computer usage and access in low-income urban communities. *Computers in Human Behavior*, 29(4), 1393-1401. doi: <https://doi.org/10.1016/j.chb.2013.01.032>
- Atkinson, R., & Flint, J. (2001). Accessing hidden and hard-to-reach populations: Snowball research strategies. *Social Research Update*, 33(1).
- Australian Bureau of Statistics (ABS). (2006). *Future living arrangements: Year Book Australia*. Canberra, Australian Capital Territory: Australian Bureau of Statistics. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/1301.0Feature%20Article92006?opendocument&tabname=Summary&prodno=1301.0&issue=2006&num=&view=>
- Australian Bureau of Statistics (ABS). (2011). *2011 Census: Australian Capital Territory (S/T)*. Canberra, Australian Capital Territory: Australian Bureau of Statistics.
- Australian Bureau of Statistics (ABS). (2014). *Household Use of Information Technology 2012-13'*, February 2014. Cat. No. 8146.0. Canberra, Australian Capital Territory: Australian Bureau of Statistics. Retrieved from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8146.02012-13?OpenDocument>
- Australian Bureau of Statistics (ABS). (2016). *Household Use of Information Technology 2014-15'*, February 2016. Cat. No. 8146.0. Canberra, Australian Capital Territory: Australian Bureau of Statistics. Retrieved from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8146.02014-15?OpenDocument>
- Australian Communications and Media Authority (ACMA). (2008). *Telecommunications in Remote Indigenous Communities*. Canberra, Australian Capital Territory: ACMA.
- Australian Government. (1994). *Networking Australia's Future: The final report of the broadband services expert group external review*. Canberra. Australian Capital Territory: Commonwealth of Australia.
- Australian Government. (2008). *Regional Telecommunications Independent Review Committee Report: Framework for the Future*. Canberra, Australian Capital Territory: Commonwealth of Australia.
- Australian National Audit Office (ANAO). (1999). *Networking the Nation Board Audit Report: The Regional Telecommunications Infrastructure Fund Audit report*. Canberra. Australian Capital Territory: ANAO.
- Badasyan, N., Shideler, D., & Silva, S. (2011). Broadband achievement index: Moving beyond availability. *Telecommunications Policy*, 35, 933-950. doi:10.1016/j.telpol.2011.09.004

- Bakardjieva, M. (2005). *Internet Society: The Internet in Everyday Life*. London, Thousand Oaks, New Delhi: Sage.
- Barzilai-Nahon, K. (2006). Gaps and bits: Conceptualizing measurements for digital divide/s. *The information society*, 22(5), 267–278.
- Baumer, E. P. S., Ames, M. G., Burrell, J., Brubaker, J. R., & Dourish, P. (2015). Why study technology non-use?. *First Monday*, 20(11), doi: <http://dx.doi.org/10.5210/fm.v20i11.6310>
- Bélanger, F., & Carter, L. (2009). The impact of the digital divide on e-government use. *Communications of the ACM*, 52(4), 132-135.
- Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, 67(8), 1595-1600. doi: <https://doi.org/10.1016/j.jbusres.2013.10.001>
- Belloc, F., Nicita, A., & Rossi, M. A. (2012). Whither policy design for broadband penetration?: Evidence from 30 OECD countries. *Telecommunications Policy*, 36(5), 382-398. doi:10.1016/j.telpol.2011.11.023
- Berg, B. L. (2007). *Qualitative Research Methods for the Social Sciences* (6th ed.). San Francisco: Pearson Education, Inc.
- Bernard, H. R. (2011). *Research methods in anthropology: Qualitative and quantitative approaches* (5th ed.). UK; Altamira press.
- Birks, M., Mills, J., Francis, K., & Chapman, Y. (2009). A thousand words paint a picture: The use of storyline in grounded theory research. *Journal of research in nursing*, 14(5), 405-417. doi: 10.1177/1744987109104675
- Boag, B., Hugo AO, G., Feist, H., Parker, K., Keough, B., & Howard, N. (2012). Linking Rural Older People to Community through Technology. Murray Mallee Aged Care Group Inc. Retrieved from https://www.adelaide.edu.au/apmrc/research/projects/Linking_Rural_Older_People_Report.pdf
- Bonner, A. (2006). *Social Exclusion and the way out*. West Sussex: Jonh Wiley & Sons, Ltd.
- Bouma, G. D. & Ling, R. (2004). *The research process* (5th ed.). South Melbourne: Oxford University Press.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40. doi:10.3316/QRJ0902027
- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. London; Sage Publications.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Breckenridge, J. P., Jones, D., Elliott, I., & Nicol, M. (2012). Choosing a methodological path: Reflections on the constructivist turn. *The Grounded Theory Review*, 11(1), 64-71.
- Brynin, M. (2006). Gender, technology and jobs. *British Journal of Sociology*, 57(3), 437–453. doi: 10.1111/j.1468-4446.2006.00119.x
- Bryant, A., & Charmaz, K. (2007). *The Sage handbook of grounded theory*. London: Sage.
- Bryman, A. (2015). *Social Research Methods* (5th ed.). Oxford University Press.
- Brynjolfsson, E., & Hitt, L. M. (2000). Beyond computation: Information technology, organizational transformation and business performance. *The Journal of Economic Perspectives*, 23-48.

- Castells, M. (1993). The informational economy and the new international division of labor. In M. C. M. Carnoy, S. S. Cohen, and F. H. Cardoso (Ed.), *In The new global economy in the information age: Reflections on our changing world* (pp. 15–43): University Park: Pennsylvania State University Press.
- Castells, M. (2000). *End of millennium*. Mass.: Blackwell.
- Centre for the Digital Future (2015). *2015 Digital Future Project: Surveying the digital future*. CA. Retrieved from <http://www.digitalcenter.org/wp-content/uploads/2013/06/2015-Digital-Future-Report.pdf>
- Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 509 –536). Thousand Oaks, CA: Sage.
- Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis*. London: Sage Publications.
- Charmaz, K. (2008). Grounded theory, in J. A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 81-110). Los Angeles: Sage Publications.
- Charmaz, C. (2014). *Constructing Grounded Theory* (2nd ed.). London: Sage Publications.
- Cheng, M. (2014). Analysis of direct public policy toward stimulating broadband diffusion: A demand and supply perspective. *Journal of Information and Communication Research*, 32(2), 93-104. Retried from https://www.jstage.jst.go.jp/article/jsicr/32/2/32_93/_pdf
- Chesley, N. (2006). Families in a high-tech age: Technology usage patterns, work and family correlates, and gender. *Journal of Family Issues*, 27, 587–608. doi: 10.1177/0192513X05285187
- Clement, A., & Shade, L. (2000). The Access Rainbow: A social/technical architecture for community networking. *Community informatics: Enabling communities with information and communications technologies*, 32-51.
- Colecchia, A., & Schreyer, P. (2002). ICT investment and economic growth in the 1990s: Is the United States a unique case? A comparative study of nine OECD countries. *Review of Income and Dynamics*, 5(2), 408–442.
- Colle, R. D., & Roman, R. (2003). Challenges in the telecentre movement, in S. Marshall, W. Taylor, X. H. Yu (Eds.), *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology* (pp.75-92). Greenwood Publishing Group.
- Community Technology Centres Association (CTCA) (2014/15). *Annual Report 2014/5*. NSW. Retrieved from <https://app.box.com/s/ma2f960lyj13wqi36luk5x8mkeptctvh>
- Compaine, B. M. (2001). *The digital divide: Facing a crisis or creating a myth?*. Mit Press.
- Comunello, F. (2010). From the digital divide to multiple divides. In E. Ferro (Eds.), *Handbook of Research on Overcoming Digital Divides: Constructing an Equitable and Competitive Information Society* (pp.588-605). Hershey, PA: Information Science Publishing.
- Conroy, S. (2009). *New National Broadband Network. Australian Government* [press release]. Retrieved from http://www.minister.dbcde.gov.au/media/media_releases/2009/022
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Cuervo, H., Wyn, J., Fu, J., Dadvand, B., & Bilinzozzi, J. C. (2017). *Global youth and spaces of belonging in China, Australia and Tanzania*. Melbourne: Youth Research Centre.

- Cuervo, M. R. V., & Menéndez, A. J. L. (2006). A multivariate framework for the analysis of the digital divide: Evidence for the European Union-15. *Information & Management*, 43(6), 756-766.
- Cushman, M., & Klecun, E. (2005). How (can) non-users engage with technology: Bringing in the digitally excluded. In E. Trauth, D. Howcroft, B. Butler, B. Fitzgerald, & J. DeGross. *Social inclusion: societal and organizational implications for information systems* (pp. 347-364). Boston, USA : Springer.
- Czernich, N., Falck, O., Kretschmer, T., & Woessmann, L. (2011). Broadband Infrastructure and Economic Growth. *Economic Journal*, 121(552), 505-532. doi:10.1111/j.1468-0297.2011.02420.x
- Daly, A. (2007). The diffusion of new technologies: community online access centres in Indigenous communities in Australia. In L.E. Dyson, M. Hendriks, & S. Gran (Eds.). *In Information technology and indigenous people* (pp. 272-285). USA: Information Science Publishing.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2008). *Annual Review 07/08*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2009). *Australia's digital economy: future direction*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2010). *Annual Review 09/10*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2011). *#au20 National Digital Economy Strategy: Leveraging the National Broadband Network to Drive Australia's Digital Productivity*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2012). *Annual Review 11/12*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2012). *Regional Telecommunications Review: Regional Communications: Empowering Digital Communities*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2013). *Annual Review 12/13*. Canberra, Australian Capital Territory: DBCDE.
- Department of Broadband, Communications and the Digital Economy (DBCDE) (2013). *Advancing Australia as a digital economy*. Canberra, Australian Capital Territory: DBCDE.
- Department of Communications. (2014). *Annual Review 13/14*. Canberra, Australian Capital Territory: DBCDE.
- Department of Communications. (2015). *Annual Review 14/15*. Canberra, Australian Capital Territory: DBCDE.
- Department of Communications, Information Technology and the Arts (DCITA) (2000). *Connecting Australia : Telecommunications Service Inquiry*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2002). *Telecommunications Action Plan for Remote Indigenous Communities*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2002). *Connecting regional Australia: The Report of the Regional Telecommunications Inquiry*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2004). *Australia's National Broadband Strategy*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2004). *Networking the Nation*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2005). *Networking the Nation: Lessons Learnt*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2006). *National broadband strategy implementation group: Key performance indicator report*. Canberra, Australian Capital Territory: DCITA.
- Department of Communications, Information Technology and the Arts (DCITA) (2006). *Broadband Blueprint*.

Canberra, Australian Capital Territory: DCITA.

- Deloitte (2015). *\$79 billion: Australia's digital economy grows and grows* [Press release]. Retrieved from <https://www2.deloitte.com/au/en/pages/media-releases/articles/79billion-australias-digital-economy-grows-and-grows-250315.html>.
- de Haan, A. (2000). Social exclusion: enriching the understanding of deprivation, Retrieved from [http://www.socialinclusion.org.np/userfiles/file/ Arjan de Haan.pdf](http://www.socialinclusion.org.np/userfiles/file/Arjan%20de%20Haan.pdf)
- DiMaggio, P., & Bonikowski, B. (2008). Make money surfing the web?: The impact of Internet use on the earnings of US workers. *American Sociological Review*, 73, 227–250.
- DiMaggio, P., & Hargittai, E. (2001). From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increases. *Princeton: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University*, 4(1), 4-2.
- Doctor, R. D. (1991). Information technologies and social equity: Confronting the revolution. *Journal of the American Society for Information Science*, 42(3), 216.
- Donner, J. (2015). *After access : Inclusion, development, and a more mobile internet*. The MIT Press.
- Durieux, D. (2017). ICTs and the Less Abled in Everyday Life, in R. Silverstone (Ed). *Media, Technology and Everyday Life in Europe: From Information to Communication* (Chapter 5). Routledge.
- Dutton, W. H., Helsper, E. J., & Gerber, M. M. (2009). *The internet in Britain: 2009*. Oxford Internet Institute.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12(4), 1143-1168. doi: 10.1111/j.1083-6101.2007.00367.x
- Emerson, L., Fear, J., Fox, S., & Sanders, E. (2012). *Parental engagement in learning and schooling: Lessons from research*. A report by the Australian Research Alliance for Children and Youth (ARACY) for the Family-School and Community Partnerships Bureau: Canberra. Retrieved from https://www.aracy.org.au/publications-resources/command/download_file/id/7/filename/Parental_engagement_in_learning_and_schooling_Lessons_from_research_BUREAU_ARACY_August_2012.pdf
- Empirica. (2006). *Benchmarking from a policy perspective: e-Inclusion Report*. European Commission, DG Information Society and Media. Retrieved from http://ec.europa.eu/information_society/europe/i2010/docs/studies/wp5_benchpol_e-inclusion_final.doc [last retrieved January 2009]
- Ertz, M., Durif, F., & Arcand, M. (2016). Collaborative Consumption or the Rise of the Two-Sided Consumer. *The International Journal of Business & Management*, 4(6). Retrieved from <https://ssrn.com/abstract=2799886>
- Etikan, I., Alkassim, R., & Abubakar, S. (2016). Comparison of Snowball Sampling and Sequential Sampling Technique. *Biometrics & Biostatistics International Journal*, 3(1), 00055, DOI: 10.15406/bbij.2016.03.00055
- Ewing, S. (2016). *Australia's digital divide is narrowing, but getting deeper*. The Conversation. <https://theconversation.com/australias-digital-divide-is-narrowing-but-getting-deeper-55232?sa=pg1&sq=Ewing&sr=3>
- Ewing, S., Rennie, E., & Thomas, J. (2015). Broadband Policy and Rural and Cultural Divides in Australia. In K. Andreasson (Eds.). *Digital Divides: The New Challenges and Opportunities of e-Inclusion* (pp. 107-214). USA: CRC Press.
- Eynon, R. & Geniets, A. (2012). On the periphery? Understanding low and discontinued internet use amongst young people in Britain. Report for the Nominet Trust, Oxford Internet Institute, Oxford.
- Eynon, R., & Helsper, E. (2011). Adults learning online: digital choice and/or digital exclusion?. *New media & society*, 13(4), 534-551.
- Eynon, R., & Helsper, E. (2015). Family dynamics and Internet use in Britain: What role do children play in adults' engagement with the Internet?. *Information, Communication & Society*, 18(2), 156-171. doi: 10.1080/1369118X.2014.942344
- Falch, M., & Henten, A. (2010). Public private partnerships as a tool for stimulating investments in broadband.

- Fan, Q. (2008). Analysis of the influence of Australia's government policy on broadband Internet access. In Y. K. Dwivedi (Eds.), *Handbook of Research on Global Diffusion of Broadband Data Transmission* (pp.109-125). IGI Global.
- Ferro, E., Helbig, N. C., & Gil-Garcia, J. R. (2011). The role of IT literacy in defining digital divide policy need. *Government Information Quarterly*, 28, 3-10. doi: <https://doi.org/10.1016/j.giq.2010.05.007>
- Fitzgerald, B., Fletcher, L., & Kop, T. (2016). *A national approach to digital inclusion and digital literacy: What can this mean for public libraries?*. Paper presented at the VALA 2016 conference, Melbourne, Australia. Retrieved from <https://www.vala.org.au/direct-download/vala2016-proceedings/vala2016-papers/608-vala2016-session-17-fitzgerald-paper/file>
- Freeman, J., Park, S., Middleton, C., & Allen, M. (2016). The importance of broadband for socio-economic development: A perspective from rural Australia. *The Information Society*, 19, 275–277. doi:10.1080/01972240390227840
- Florence School of Regulation (FSR) (2011) Broadband Diffusion: Drivers and Policies, retrieved from https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwi78f7O1dLUAhUGnpQKHwsGBJ0QFgkMAA&url=http%3A%2F%2Fsiva-project.eu%2Fdownload.php%3F%3Dentries%2F0157_1727.pdf&usg=AFQjCNETJTboT54RMZR3IoENRd_-XA80Xg
- Fornefeld, M., Delaunay, G., & Elixmann, D. (2008). *The Impact of Broadband on Growth and Productivity*. Düsseldorf: MICUS Management Consulting GmbH.
- Galperin, H. (2010). Goodbye digital divide, Hello digital confusion? A critical embrace of the emerging ICT4D consensus. *Information Technologies & International Development*, 6(SE), pp. 53-55.
- García-Muñiz, A. S., & Vicente, M. R. (2014). ICT technologies in Europe: A study of technological diffusion and economic growth under network theory. *TelecommunicationsPolicy*. 38(4), 360-370.
- Georgiou, G. (2004). *General IT Literacy: A research report of a Survey of the British population on computer Usage*. The British Computer Society.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Gibson, M. (2006). Social exclusion and ICT: barriers and incentives to digital inclusion (Doctoral dissertation, University of Glasgow).
- Given, J. (2010). The most connected place on the planet. *Communication, Politics & Culture*, 43(1), 120-142. Retrieved from <http://search.informit.com.au/documentSummary;dn=147797709634063;res=IELAPA>
- Glaser, B. (2011). *Getting Out of the Data: Grounded Theory Conceptualization*. Mill Valley, CA: Sociology Press.
- Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago; Aldine Publishing Company.
- Gonzales, A. (2016). The contemporary US digital divide: From initial access to technology maintenance, *Information, Communication & Society*, 19(2), 234-248, doi: 10.1080/1369118X.2015.1050438
- Gordon, D., Adelman, L., Ashworth, K., Bradshaw, J., Levitas, R., Middleton, S., ... & Williams, J. (2000). Poverty and social exclusion in Britain. Research report of Joseph Rowntree Foundation. Retrieved from <http://eprints.whiterose.ac.uk/73358/1/Document.pdf>
- Government for the Third Millennium (Gov3) (n.d.). Benchmarking Digital Inclusion: A White Paper by gov3 limited. Retrieved from <http://w2i.com/images/user/files/587.pdf>
- Green, R. M. (2006). Unpacking "I Don't Want It"-why novices and non-users don't use the Internet. *First Monday*, 11(9). Retrieved from <http://www.firstmonday.dk/ojs/index.php/fm/article/view/1395/1313>
- Greenstein, S., & McDevitt, R. C. (2009). *The Broadband Bonus: Accounting for Broadband Internet's Impact on U.S. GDP*: Kellogg School of Management and Department of Economics, Northwestern University.

- Griffiths, P., Gossop, M., Powis, B., & Strang, J. (1993). Reaching hidden populations of drug users by privileged access interviewers: Methodological and practical issues. *Addiction*, 88, 1617-1626.
- Gubrium, E., & Koro-Ljungberg, M. (2005). Contending with border making in the social constructionist interview. *Qualitative Inquiry*, 11(5), 689-715. doi: 10.1177/1077800405278776
- Gumucio Dagron, A. (2001). Prometheus Riding a Cadillac? Telecenters as the promised flame of knowledge. *The Journal of Development Communication*, 12(2), 1-7.
- Gurstein, M. (2003). Effective use: A community informatics strategy beyond the digital divide. *First Monday*, 8(12).
- International Communication Union (ITU) (2012). *Measuring the Information Society. Geneva, Switzerland: International Telecommunication Union*. Retrieved from http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf.
- International Communication Union (ITU) (2013). ITU World Telecommunication/ICT Indicators database.2013, <http://www.itu.int/ITU-D/ict/statistics/explorer/index.html>
- International Communication Union (ITU) (2014). ITU World Telecommunication/ICT Indicators database.2014, <http://www.itu.int/ITU-D/ict/statistics/explorer/index.html>
- International Communication Union (ITU) (2016). ITU World Telecommunication/ICT Indicators database.2016, <http://www.itu.int/ITU-D/ict/statistics/explorer/index.html>
- Haddon, L. (2004). *Information and communication technologies in everyday life: A concise introduction and research guide*. Oxford: Berg.
- Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First monday*, 7(4). Retrieved from <http://firstmonday.org/article/view/942/864>
- Hauge, J., & Prieger, J. (2009). Demand-side programs to stimulate adoption of broadband: What works?. *Social Sciences Research Network*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1492342
- Hayes, A., Gray, M., & Edwards, B. (2008). *Social inclusion: Origins, concepts and key themes*. Canberra: Australian Government. Retrieved from www.socialinclusion.gov.au/Resources/Pages/Resources.aspx
- Hearn, G. N., Simpson, L. E., Lennie, J., & Kimber, M. P. (2004) ICTs and regional sustainability: A critique and a way forward. In Johanson, Graeme and Stillman, Larry, Eds. *Proceedings Community Informatics Research Network Conference and Colloquium 2004: Sustainability and community technology*, Prato, Italy.
- Heckathorn, D. D. (2011). Comment: snowball versus respondent-driven sampling. *Sociological methodology*, 41(1), 355-366.
- Helsper, E. J. (2008). *Digital inclusion: An analysis of social disadvantage and the information society*. Department for Communities and Local Government, London, UK. Retrieved from http://eprints.lse.ac.uk/26938/1/_libfile_REPOSITORY_Content_Helsper,%20E_Digital%20inclusion_Helsper_Digital%20inclusion_2013.pdf
- Helsper, E. J. (2011). *The Emergence of a Digital Underclass: Digital policies in the UK and evidence for Inclusion*. LSE Media Policy Project
- Helsper, E. J. (2011). *The emergence of a digital underclass: digital policies in the UK and evidence for inclusion*. In S. B. Micova, Z. Sujon, & D. Tambini (Dds.). LSE Media Policy Project Series: Media Policy Brief 3. Department of Media and Communications, London School of Economics and Political Science, London, UK.

- Helsper, E. J. (2012). A corresponding fields model for the links between social and digital exclusion. *Communication theory*, 22 (4), 403-426. doi:10.1111/j.1468-2885.2012.01416.x
- Helsper, E. J. (2016). The Social Relativity of Digital Exclusion: Applying relative deprivation theory to digital inequalities. *Communication Theory*. 1-20. doi: 10.1111/comt.12110
- Helsper, E. J., & Eynon, R. (2013). Distinct skill pathways to digital engagement. *European Journal of Communication*, 28(6), 696-713. doi:10.1177/0267323113499113
- Helsper, E. J., & Reisdorf, B. C. (2016). The emergence of a “digital underclass” in Great Britain and Sweden: Changing reasons for digital exclusion. *new media & society*, doi: 10.1177/1461444816634676.
- Hilbert, M. (2011). The endjustifiesthedefinition:The manifold outlooks on the digital divide and their practical usefulness for policy-making. *Telecommunications Policy*, 35, 715–736. doi:10.1016/j.telpol.2011.06.012
- Hoffman, D. L., Novak, T.P., & Schlosser A. E. . (2001). The evolution of the digital divide: Examining the relationship of race to Internet access and usage over time. In B. M. Compaine (Ed.), *The Digital Divide: Facing a Crisis or Creating a Myth?* (pp. 47-98). Cambridge, MA: The MIT Press
- Hollingworth, S., Mansaray, A., Allen, K., & Rose, A. (2011). Parents' perspectives on technology and children's learning in the home: social class and the role of the habitus. *Journal of Computer Assisted Learning*, 27(4), 347-360. doi:10.1111/j.1365-2729.2011.00431.x.
- Holloway, D. (2005). The digital divide in Sydney. *Information, Communication & Society*, 8(2), 168-193. doi: 10.1080/13691180500146276
- Jung, M., Park, S. & Lee, J. (2014). Information Network Villages: A community-focused digital divide reduction policy in rural Korea. *Australian Journal of Telecommunication and the Digital Economy*, 2(1), 21.1-16. doi: 10.7790/ajtde.v2n1.21
- Katz, J. E., & Rice, R. E. (2002). *Social consequences of Internet use: Access, involvement, and interaction*. Cambridge, MA: MIT Press.
- Katz, V. S., & Gonzalez, C. (2016). Toward meaningful connectivity: using multilevel communication research to reframe digital inequality. *Journal of Communication*, 66(2), 236-249. doi: 10.1111/jcom.12214
- Keen, C., Steer, D., & Turner. P. (2008). Holistic evaluation of the roles of ICTs in regional development. In V. S. Craig (Ed.). *Information communication technology: Concepts, methodologies, tools and applications* (pp.54-65). IGI Global.
- Kelly, T., Mulas, V., Raja, S., Qiang, C. Z., & Williams, M. (2009). What role should governments play in broadband development?. Paper prepared for *infoDev/OECD workshop on Policy Coherence in ICT for Development*, Paris.
- Kim, J. H. (2002). The policy orientation and tasks of master plan for digital divide solution in Korea. *Journal of Social Science Research*, 10(1).
- Kim, Y., Kelly, T., & Raja, S. (2010). *Building broadband: Strategies and policies for the developing world*. World Bank Publications. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/282822-1208273252769/Building_broadband.pdf
- Klimaszewski, C., & Nyce, J. (2009). Does universal access mean equitable access?: What an information infrastructure study of a rural Romanian community can tell us. *New Library World*, 10(5), 219-236.

- Kolko, J. (2010). Does Broadband Boost Local Economic Development? . *San Francisco: Public Policy Institute of California*.
- Kongaut, C., & Bohlin, E. (2015). Towards broadband targets on the EU Digital Agenda 2020: discussion on the demand side of broadband policy. *info*, 17(3), 1-15. doi:10.1108/info-02-2015-0017
- Kretschmer, T. (2012). Information and communication technologies and productivity growth: A survey of the literature. *OECD Digital Economy Papers, OECD Publishing, No. 195*. doi:10.1787/20716826
- Kvasny, L. (2005). The role of the habitus in shaping discourses about the digital divide. *Journal of Computer-Mediated Communication*, 10(2).
- Lally, E. (2002). *At home with computers*. Berg Publishers.
- Lawrence, J., & Tar, U. The use of Grounded Theory technique as a practical tool for qualitative data collection and analysis. *The Electronic Journal of Business Research Methods*, 11(1), 29-40.
- Lawson, C. (2007). Technology, Technological Determinism and the Transformational Model of Technical Activity. In C. Lawson, J. Latsis & N. Martins (Eds.) *Contributions to Social Ontology* (pp. 32–49). London: Routledge.
- Lehr, W., Bauer, S., & Clark, D. D. (2013). Measuring Performance when Broadband is the New PSTN. *Journal of Information Policy*, 3, 411-441. Retrieved from <http://www.jstor.org/stable/10.5325/jinfopoli.3.2013.0411>
- Neice, D. C. (1998). *Measures of Participation in the Digital Technostructure: Internet Access*. University of Sussex, SPRU.
- Le Lievre, K. (2017, January 21). There are third world countries with better internet”: Tuggeranong residents in Theodore fed up with waiting for NBN. *The Canberra Times*. Retrieved from <http://www.canberratimes.com.au/act-news/there-are-third-world-countries-with-better-internet-tuggeranong-residents-in-theodore-fed-up-with-waiting-for-nbn-20170120-gtv8ho.html>
- Leung, L. (2014). Availability, access and affordability across ‘digital divides’: common experiences amongst minority groups. *Australian Journal of Telecommunications and the Digital Economy*, 2(2), X.1-15. doi: <http://doi.org/10.7790/ajtde.v2n2.X>
- Lievrouw, L. A., & Farb, S. E. (2003). Information and equity. *Annual review of information science and technology*, 37(1), 499-540. doi:10.1002/aris.1440370112
- Lin, M. S., & Wu, F. S. (2013). Identifying the determinants of broadband adoption by diffusion stage in OECD countries. *Telecommunications Policy*, 37(4), 241-251. doi:10.1016/j.telpol.2012.06.003
- Livingstone, S. (2004). The challenge of changing audiences: or, what is the audience researcher to do in the internet age? *European Journal of Communication*, 19(1), 75-86.
- Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New media & society*, 9(4), 671-696.
- Lloyd, R., & Bill, A. (2004). *Australia online: how Australians are using computers and the Internet 2001*, a joint publication by the ABS and NATSEM, Canberra.
- Loader, B. D., & Keeble, L. (2004). *Challenging the Digital Divide? A literature review of community informatics initiatives*. York: Joseph Rowntree Foundation.
- Lyons, J. D. (2011). *The digital divide: A redefinition based on application* (Doctoral dissertation, Saint Louis University).

- Makinen, M. (2006). Digital Empowerment as a Process for Enhancing Citizens' Participation. *E-learning*, 3(3), 381-395.
- Mancinelli, E. (2007). *e-Inclusion in the Information Society*. European Commission and Network for Teaching Information Society (NETIS). Budapest.
- Maram, A., & Ruggeri, D. (2013). The Digital Divide: Issue Framing and Policy Responses. *American Journal of Management*, 13(1), 112-120.
- Mariën, I., & A. Prodnik, J. (2014). Digital inclusion and user (dis) empowerment: A critical perspective. *info*, 16(6), 35-47.
- Martin, S. P., & Robinson, J. P. (2007). The income digital divide: Trends and predictions for levels of Internet use. *Social Problems*, 54(1), 1-22. doi: 10.1525/sp.2007.54.1.1
- Maloney, B. J. (2014). Psychological barriers to internet use among older adults (Doctoral dissertation, University of Alabama).
- McDonald, M. (2011). *What role can child and family services play in enhancing opportunities for parents and families?* Exploring the concepts of social exclusion and social inclusion (CAFCA Practice Sheet). Melbourne: Australian Institute of Family Studies. Retrieved from <http://www.aifs.gov.au/cafca/pubs/sheets/ps/ps7.html>
- Melenhorst, A. S., Rogers, W. A., & Bouwhuis, D. G. (2006). Older adults' motivated choice for technological innovation: Evidence for benefit-driven selectivity. *Psychology and aging*, 21(1), 190.
- Mesch, G. S., & Talmud, I. (2011). Ethnic differences in internet access. *Information, Communication & Society*, 14(4), 445-471. doi: 10.1080/1369118X.2011.562218
- Middleton, C. (2013). Beyond Broadband Access: What Do We Need to Measure and How Do We Measure It? In Napoli, p. & Taylor R. & Schejter A. (Eds.), *Beyond Broadband Access: Developing Data-Based Information Policy Strategies* (pp. 9-22). Fordham University. Retrieved from <http://www.jstor.org/stable/j.ctt13x0851.5>
- Middleton, C. (2014). Building a Digital Society: Questions for communication researchers. *Australian Journal of Telecommunications and the Digital Economy*, 2(1), 27.1-27.11. doi: <http://doi.org/10.7790/ajtde.v2n1.27>
- Milner, H. (2006). The digital divide: The role of political institutions in technology diffusion. *Comparative Political Studies*, 39(2), 176–199.
- Molnár, S. (2003). The explanation frame of the digital divide. *Proceedings of the Summer School, "Risks and Challenges of the Network Society"*, 4-8. Karlstad University, August.
- Montagnier, P., & Wirthmann, A. (2011). Digital Divide: From computer access to online activities – a micro data analysis. OECD Digital Economy Papers (No. 189). Paris: OECD Publishing. Retrieved from <http://dx.doi.org/10.1787/5kg0lk60rr30-en>
- Morrell, R. W., Mayhorn, C. B., & Bennett, J. (2000). A survey of World Wide Web use in middle-aged and older adults. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 42, 175–182.
- Morsillo, R. (2012). Affordable broadband for all Australians. *Telecommunications Journal of Australia*, 62(5), 80.1-80.16.

- Mori, C. K. (2010). "Digital inclusion": are we all talking about the same thing? In: Steyn, J. (Ed.), *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives* (pp. 45–64). Information Science Reference, New York.
- Morse, J. M. (1995). The significance of saturation. *Qualitative Health Research*, 5, 147–149.
- Mossberger, K., Tolbert, C. J., & Stansbury, M. (2003). *Virtual inequality. Beyond the digital divide.* : Washington, D.C.: Georgetown University Press.
- Nagel, D. A., Burns, V. F., Tilley, C., & Aubin, D. (2015). When novice researchers adopt constructivist grounded theory: Navigating less travelled paradigmatic and methodological paths in PhD dissertation work. *International Journal of Doctoral Studies*, 10, 365-383. Retrieved from <http://ijds.org/Volume10/IJDSv10p365-383Nagel1901.pdf>
- Nansen, B., Wilken, R., Arnold, M., & Gibbs, M. (2013). Digital literacies and the National Broadband Network: Competency, legibility, context. *Media International Australia*, 147(1), 18-28.
- National Office for the Information Economy (NOIE) (2003). Australia's Broadband Connectivity: Broadband Advisory Group. Canberra, Australian Capital Territory: NOIE.
- National Office for the Information Economy (NOIE) (2004). Australia's National Broadband Strategy. Canberra, Australian Capital Territory: NOIE.
- Newman, L. A., Biedrzycki, K. & Baum, F. E. (2010). Digital technology access and use among socially and economically disadvantaged groups. *Journal of Community Informatics*, 6(2), 1-31.
- Newman, L., & Gurstein, M. (2016). *Goodbye Digital Divide, Hello Digital Equity*. Croakey. Retrieved from <https://croakey.org/goodbye-digital-divide-hello-digital-equity-and-why-we-need-to-go-the-extra-mile-to-get-it/>.
- Norris, P. (2001). *Digital divide, civic engagement, information poverty and the internet worldwide*: Cambridge: University Press.
- Notley, T., & Foth, M. (2008). Extending Australia's digital divide policy: An examination of the value of social inclusion and social capital policy frameworks. *Australian Social Policy*, 7, 87-110. Retrieved from <https://eprints.qut.edu.au/12021/1/12021b.pdf>
- Oliner, S. D., & Sichel, D. J. (2000). The resurgence of growth in the late 1990's: Is information technology the story? *Journal of Economic Perspectives*, 14(4), 3-22.
- Organisation for Economic Co-operation and Development (OECD) (2001). *Bridging the "digital divide": Issues and policies in OECD countries*. OECD Publishing. Retrieved from <https://www.oecd.org/sti/broadband/27128723.pdf>
- Organisation for Economic Co-operation and Development (OECD) (2011). *OECD Communications Outlook 2011*. OECD Publishing, Paris. doi:http://dx.doi.org/10.1787/comms_outlook-2011-en
- Organisation for Economic Co-operation and Development (OECD) (2015). *OECD Digital Economy Outlook 2015*. OECD Publishing, Paris. doi:<http://dx.doi.org/10.1787/9789264232440-en>
- Oxford Internet Institute (2013). *Oxford Internet Survey 2013 Report: Cultures of the Internet*. UK: Oii. Retrieved from <http://oxis.oii.ox.ac.uk/wp-content/uploads/sites/43/2014/11/OxIS-2013.pdf>
- Pandya, J. Z. (2017). Digital Diversity. In Mills, K. A. & Stornaiuolo, A. Smith, A. & Pandya, J. Z. (Eds.) *Handbook of Writing, Literacies, and Education in Digital Cultures*. Routledge.
- Park, S. (forthcoming). *Digital Capital*. New York, NY: Palgrave-Macmillan.

- Park, S. (2012). Dimensions of digital media literacy and the relationship to social exclusion. *Media International Australia*, 142, 87-100. 87-100
- Park, S. (2014). The role of local intermediaries in the process of digitally engaging non-users of the internet, *Media International Australia*, 151, 137-145.
- Park, S., Burford, S., Lee, J., & Toy, L. (2016). *Mobile health: Empowering people with type 2 diabetes using digital tools*. News & Media Research Centre, University of Canberra, Canberra.
- Park, S., & Lee, J. (2017). *Effective informal support models of digital literacy: Warm Experts and intermediaries*. Presented at the Partnership for Progress on the Digital Divide (PPDD) 2017 International Conference, San Diego, USA
- Park, S., Middleton, C., & Allen, M. (2013). Conceptualizing the (non) users of the internet, Paper Presented at the Association of Internet Researchers 14th Annual Conference (IR14) Denver.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications.
- Pavlidis, K., & Gadir, J. (2013). Improving affordability of communications: Research and policy directions. *Australian Journal of Telecommunications and the Digital Economy*, 1(1), 10.1-8. Retrieved from <http://doi.org/10.7790/ajtde.v1n1.10>
- Percy-Smith, J. (2000). *Policy responses to social exclusion: Towards inclusion?*. McGraw-Hill Education (UK).
- Perlgut, D. (2011). *Digital Inclusion in the Broadband World: Challenges for Australia*. Paper presented at the Communications Policy and Research Forum, Sydney, Australia. Retrieved from <https://donperlgut.files.wordpress.com/2011/11/don-perlgut-digital-inclusion-paper-cprf-7nov2011.pdf>
- Pew Research Center (2009). *Home Broadband Adoption 2009*. Washington DC: Pew Research Center. Retrieved from <http://www.pewinternet.org/files/old-media/Files/Reports/2009/Home-Broadband-Adoption-2009.pdf>
- Pew Research Center (2013). *Who's not online and why*. Washington DC: Pew Research Center. Retrieved from <http://pewinternet.org/Reports/2013/Non-internet-users.aspx>
- Pew Research Center (2015). *Social media and the cost of caring*. Washington DC: Pew Research Center. Retrieved from <http://www.pewinternet.org/2015/01/15/social-media-and-stress/>
- Philip, L., Cottrill, C., Farrington, J., Williams, F., & Ashmore, F. (2017). The digital divide: Patterns, policy and scenarios for connecting the 'final few' in rural communities across Great Britain. *Journal of Rural Studies*, 1-13. doi: <http://dx.doi.org/10.1016/j.jrurstud.2016.12.002>
- Polit, D. F., & Beck, C. T. (2012). *Nursing research: generating and assessing evidence for nursing practice*. Philadelphia : Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Powell, A., Bryne, A., & Dailey, D. (2010). The essential internet: Digital exclusion in low-income American communities. *Policy & Internet*, 2, 159–190. doi:10.2202/1944-2866.1058
- Preston, P., & Cawley, A. (2008). Broadband development in the European Union to 2012-A virtuous circle scenario. *Futures*, 40(9), 812-821.
- Prieger, J. E., & Hu, W. M. (2008). The broadband digital divide and the nexus of race, competition, and quality. *Information Economics and Policy*, 20(2), 150–167.

- Proenza, F. (2005). Telecenter Sustainability: Myths and Opportunities. In H. Wattenbach, C. Bishop-Sambrook, & J. Dixon (Eds.). *Improving information flows to the rural community* (pp. 45-56). Rome: Food and Agriculture Organization of the United Nations (FAO).
- Quan-Haase, A., Mo, G. Y., & Wellman, B. (2017). Connected seniors: how older adults in East York exchange social support online and offline. *Information, Communication & Society*, 20(7), 967-983. doi: <http://dx.doi.org/10.1080/1369118X.2017.1305428>
- Ragnedda, M., & Muschert, G. W. (2013). *The Digital Divide: The Internet and Social Inequality in International Perspective*: Taylor & Francis.
- Ragnedda, M., & Mutsvauro, B. (2016). Demystifying digital divide and digital leisure. In S. Carnicelli, D. McGillivray, & G. McPherson (Eds.). *Digital leisure cultures: critical perspectives* (pp. 107-119). New York: Routledge.
- Rahman, A., & Quaddus, M. (2012). Qualitative investigation of digital divide in Indonesia: Toward a comprehensive framework. *Proceedings of the 23rd Australasian Conference on Information Systems 2012* (pp. 1-10). ACIS. Geelong, Australia. Retrieved from <http://dro.deakin.edu.au/eserv/DU:30049100/rahman-qualitativeinvestigation-2012.pdf>
- Reese, S. (1998). New communication technologies and the information worker: The influence of occupation. *Journal of Communication*, 38(2), 59–70.
- Reisdorf, B. C., Axelsson, A. S., & Söderholm, M. H. (2012). *Living Offline: A qualitative study of Internet non-use in Great Britain and Sweden*. Paper presented at the 13th annual international and interdisciplinary conference of the Association of Internet Researchers (AoIR), Salford, UK. Retrieved from <http://spir.aoir.org/index.php/spir/article/view/10>
- Reisdorf, B. C., & Grosej, D. (2015). Internet (non-)use types and motivational access: Implications for digital inequalities research. *new media & society*, 1- 20. doi: 10.1177/1461444815621539
- Robinson, L. (2009). A taste for the necessary: A Bourdieuan approach to digital inequality. *Information, Communication & Society*, 12(4), 488-507, doi: 10.1080/13691180902857678
- Roberts, G. B. (2011). What do you do with your community IT centre? Life stories, social action and the Third Space: a biographical narrative interpretive study of adult users of a community IT centre (Doctoral dissertation, University of Southampton).
- Roe, K., & Broos, A. (2005). Marginality in the information society: The socio-demographics of computer disquietude. *Communications: The European Journal of Communication*, 30(1), 91-96.
- Roman, R., & Colle, R. (2001). Digital Divide or Digital Bridge: Exploring threats and opportunities to participation in telecenter initiatives. *Technowlogia*, 3 (3).
- Ruhle, E.-O., Brusica, I., Kittl, J., & Ehrler, M. (2011). Next Generation Access (NGA) supply side interventions: An international comparison. *Telecommunications Policy*, 35(9–10), 794-803. doi: <http://dx.doi.org/10.1016/j.telpol.2011.06.001>
- Sánchez-Valle, M., Abad, M. V., & Llorente-Barroso, C. (2017). Empowering the Elderly and Promoting Active Ageing Through the Internet: The Benefit of e-inclusion Programmes. In I. Kollak (Ed.) *Safe at Home with Assistive Technology* (pp. 95-108). Springer International Publishing.
- Seale, J., & Dutton, W. (2012). Empowering the digitally excluded: Learning initiatives for (in)visible groups. *Research in Learning Technology*, 20, 313-321. doi: <http://dx.doi.org/10.3402/rlt.v20i0.20214>

- Selwyn, N. (2003). Apart from technology: understanding people's non-use of information and communication technologies in everyday life. *Technology in society*, 25(1), 99-116. doi: [https://doi.org/10.1016/S0160-791X\(02\)00062-3](https://doi.org/10.1016/S0160-791X(02)00062-3)
- Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New media & society*, 6(3), 341-362. doi: 10.1177/1461444804042519
- Selwyn, N. (2006). Digital division or digital decision?: A study of have-nots and low-users of computers. *Poetics*, 34(4-5), 273-292. doi: <https://doi.org/10.1016/j.poetic.2006.05.003>
- Selwyn, N., & Facer, K. (2007). Beyond the digital divide: Rethinking digital inclusion for the 21st Century, Bristol, UKL FutureLab, Retrieved from <http://www.immagic.com/eLibrary/ARCHIVES/GENERAL/FUTRLBUK/F070530B.pdf>.
- Selwyn, N., & Facer, K. (2010). Beyond the digital divide: Toward an Agenda for Change. In E. Ferro, Y. K. Dwivedi, R. Gil-Garcia, & M. D. Williams (Eds.), *Overcoming Digital Divides: Constructing an Equitable and Competitive Information Society*. Hershey, PA: IGI Global.
- Selwyn, N., Gorard, S., & Furlong, J. (2005). Whose Internet is it anyway? Exploring adults' (non) use of the Internet in everyday life. *European Journal of Communication*, 20(1), 5-26. doi: 10.1177/0267323105049631
- Selwyn, N., Johnson, N., Nemorin, S., & Knight, E. (2016). *Going online on behalf of others: an investigation of 'proxy' internet consumers*. Sydney: Australian Communications Consumer Action Network (ACCCA). Retrieved from https://accan.org.au/files/Grants/ACCAN_Monash_2016_Going%20online%20on%20behalf%20of%20others_WEB.pdf
- Servon, L. J. (2002). *Bridging the Digital Divide: Technology, Community, and Public Policy*. Malden, MA: Blackwell Publishing.
- Shahiduzzaman, M., & Alam, K. (2014). Information technology and its changing roles to economic growth and productivity in Australia. *Telecommunications Policy*, 38(2), 125-135. doi: <http://dx.doi.org/10.1016/j.telpol.2013.07.003>
- Shin, D. & Kweon, S. H. (2011). Evaluation of Korean information infrastructure policy 2000-2010: Focusing on broadband ecosystem change. *Government Information Quarterly*, 28, 374-387. doi:10.1016/j.giq.2010.07.009
- Silverstone, R. (2017). *Media, Technology and Everyday Life in Europe: From Information to Communication*. Routledge.
- Singh, M., Molla, A., Karanasios, S., & Sargent, J. (2008). Exploring the impact of government ICT initiatives on the livelihood of Australian rural communities. In *Proceedings 11 of 21st Bled eConference eCollaboration: Overcoming Boundaries through Multi-Channel Interaction* (pp. 464-474). Slovenia: AISeL. Retrieved from <http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1034&context=bled2008>
- Slocombe, J., & Craig, S. (2012). *Inquiry into cybersafety for senior Australians*. The Alannah and Madeline Foundation, Melbourne. Retrieved from file:///C:/Users/s428773/Dropbox/4.%20THESIS/WT/00.references/Dicussion/http---www.aphref.aph.gov.au-house-committee-jscs-senior_australians-subs-sub35.pdf
- Stojilovic, I. (2012). *Importance and relevance of telecentres*. International Aid Network (IAN). Retrieved from <http://www.ian.org.rs/fotografije/2012Beogradradionica/big/IMPORTANCE%20AND%20RELEVANCE%20OF%20TELECENTRES.pdf>

- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- Stroud, D. (2012). The digitally excluded consumer: Options for marketers. *Journal of Direct, Data and Digital Marketing Practice*, 14(1), 5-17.
- Strover, S. (2014). The US digital divide: A call for a new philosophy. *Critical Studies in Media Communication*, 31(2), 114–122. doi: <http://dx.doi.org/10.1080/15295036.2014.922207>
- Tasmanian Government Department of Education (2016). Annual Report (2015/16). Tasmania: Tasmanian Government Department of Education. Retrieved from <https://www.education.tas.gov.au/documentcentre/Documents/DoE-Annual-Report-2015-16.pdf>
- Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American journal of evaluation*, 27(2), 237-246.
- Thomas, J. (2016). *The stratifying internet*. Inside story. <http://insidestory.org.au/the-stratifying-internet>
- Thomas, J., Barraket, J., Ewing, S., MacDonald, T., Mundell, M., & Tucker, J. (2016). Measuring Australia's Digital Divide: The Australian Digital Inclusion Index 2016, Swinburne University of Technology, Melbourne, for Telstra. doi: www.dx.doi.org/10.4225/50/57A7D17127384
- Thorén, C., & Kitzmann, A. (2015). Replicants, imposters and the real deal: Issues of non-use and technology resistance in vintage and software instruments. *First Monday*, 20(11).
- Tsatsou, P. (2011). Digital divides revisited: what is new about divides and their research?. *Media, Culture & Society*, 33(2), 317-331.
- Vandenbroeck, M., Verschelden, G., & Boonaert, T. (2008). E-learning in a low-status female profession: The role of motivation, anxiety and social support in the learning divide. *Journal of Computer Assisted Learning*, 24(3), 181-190.
- Van Deursen, A. J., & Van Dijk, J. (2010). The Internet skills and the digital divide. *New Media & Society*, 11(11), 1-19.
- Van Deursen, A. J., & Helsper, E. J. (2015). A nuanced understanding of Internet use and non-use among the elderly. *European journal of communication*, 30(2), 171-187.
- Van Deursen, A. J., & Helsper, E. J. (2016). The third-level digital divide: Who benefits most from being online?, *Communication and Information Technologies Annual: Digital Distinctions and Inequalities Studies in Media and Communications*, 10, 29-53, doi: 10.1108/S2050-206020150000010002.
- Van Deursen, A. J., Helsper, E. J., Eynon, R., & Van Dijk, J. (2017). The compoundness and sequentiality of digital inequality. *International Journal of Communication*, 11, 452-473. Retrieved from <https://ora.ox.ac.uk/objects/uuid:2122100f-3c10-4e72-ba36-60a66594d8dd>
- Van Dijk, J. (2003). A framework for digital divide research. *Electronic Journal of Communication/Revue de Communication Electronique*, 12(1). Retrieved from http://www.cios.org/getfile/vandijk_.
- Van Dijk, J. (2005). *The Deepening Divide: Inequality in the Information Society*: SAGE Publications.
- Van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34(4–5), 221-235. doi: <http://dx.doi.org/10.1016/j.poetic.2006.05.004>

- Van Dijk, J. (2013). A theory of the digital divide. In M. Ragnedda, & G. W. Muschert (Eds.), *The digital divide: The internet and social inequality in international perspective* (pp. 29-51). London and New York: Routledge.
- Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The information society, 19*(4), 315–326.
- Van Dijk, J., & Van Deursen, A. J. (2009). Inequalities of digital skills and how to overcome them. In E. Ferro (Eds.), *Handbook of Research on Overcoming Digital Divides: Constructing an Equitable and Competitive Information Society* (pp. 278-291). Hershey, PA: Information Science Publishing.
- Van Gaasbeek, K. A. (2008). A rising tide: Measuring the economic effects of broadband use across California. *The Social Science Journal, 45*(4), 691-699. doi:<http://dx.doi.org/10.1016/j.soscij.2008.09.017>
- Van Laer, J., & Van Aelst, P. (2010). Internet and social movement action repertoires: Opportunities and limitations. *Information, Communication & Society, 13*(8), 1146-1171. doi: 10.1080/13691181003628307
- Verdegem, P., & Verhoest, P. (2008). The relative utility approach for stimulating ICT acceptance: Profiling the non-user. *European Journal of ePractice, 3*, 36-46.
- Verdegem, P., & Verhoest, P. (2009). Profiling the non-user: Rethinking policy initiatives stimulating ICT acceptance. *Telecommunications Policy, 33*(10), 642-652.
- Walton, P., Kop, T., Spriggs, D., & Fitzgerald, B. (2013). A digital inclusion: Empowering all Australians. *Australian Journal of Telecommunications and the Digital Economy, 1*(1), 9.1-17. doi: <http://doi.org/10.7790/ajtde.v1n1.9>
- Warschauer, M. (2002). Reconceptualizing the digital divide. First Monday. Retrieved from http://firstmonday.org/issues/issue7_7/warschauer/index.html
- Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge: MIT Press.
- Warschauer, M. (2004). *Technology And Social Inclusion: Rethinking The Digital Divide*: Massachusetts Institute of Technology.
- Warschauer, M. & Newhart, V. A. (2016). Broadening our concepts of universal access. *Universal Access in the Information Society, 15*, 183–188. doi:10.1007/2Fs10209-015-0417-0.
- Warren, M. (2007). The digital vicious cycle: Links between social disadvantage and digital exclusion in rural areas. *Telecommunications Policy, 31*, 374–388. doi:10.1016/j.telpol.2007.04.001
- Welsh Government. (2014). Digital Inclusion Delivery Plan. Retrieved from https://www.learningandwork.org.uk/wp-content/uploads/2017/01/Welsh-Govt-Digital_Inclusion_Delivery_Plan_2014.pdf
- Whitworth, A., Garnett, F., & Pearson, D. (2012). Aggregate-then-Curate: how digital learning champions help communities nurture online content. *Research in Learning Technology, 20*(4), 18677. doi: <http://dx.doi.org/10.3402/rlt.v20i0.18677>
- Wilmot, A. (2009). Designing sampling strategies for qualitative social research: with particular reference to the Office for National Statistics' Qualitative Respondent Register. Retrieved from <https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiQ0fy50tPUAhVTNbwKHT8PD4kQFggkMAA&url=https%3A%2F%2Fwww.ons.gov.uk%2Fons%2Fabout-ons%2Fwho-we-are%2Fservices%2Fdata-collection-methodology%2Freports-and->

publications%2Fdesigning-sampling-
strategies-.pdf&usg=AFQjCNHtcqK9LPjZPiCpFmRMQzrHIN1GQ

- Wong, Y. C., Law, C. K., Fung, J. Y. C., & Lee, V. W. P. (2010). Digital divide and social inclusion: policy challenge for social development in Hong Kong and South Korea. *Journal of Asian Public Policy*, 3(1), 37-52. doi: 10.1080/17516231003634161
- World Bank (2012). *Broadband strategies handbook*. Washington DC. Retrieved from http://www.cto.int/wp-content/themes/solid/_layout/dc/k-r/Broadband%20Strategies%20Handbook.pdf
- World Economy Forum (2013). *The Global Information Technology Report 2013: Growth and jobs in a hyperconnected world*. Geneva: World Economy Forum. Retrieved from http://www3.weforum.org/docs/WEF_GITR_Report_2013.pdf
- Wyatt, S. (2003). Non-users also matter: The construction of users and non-users of the Internet. In N. Oudshoorn, & T. J. Pinch. *Now Users Matter: The co-construction of users and technology* (pp. 67-79). MIT Press.
- Wyatt, S. (2014). Bringing users and non-users into being across methods and disciplines. In CHI 2014 Workshop Considering Why We Should Study Technology Non-use. Retrieved from http://nonuse.jedbrubaker.com/wp-content/uploads/2014/03/Wyatt_Toronto_April_2014.pdf
- Wyatt, S., Thomas, G. & Terranova, T. (2002) They Came, They Surfed, They Went Back to the Beach, Conceptualising Use and Non-use of the Internet, in S. Woolgar (Ed.), *Virtual Society?* (pp. 23–40). Oxford: Oxford University Press.
- Witte, J. C., & Mannon, S. E. (2010). *The Internet and social inequalities*. New York: Routledge.
- Youtie, J., Shapira, P., & Laudeman, G. (2007). Supply, demand and ICT-based services: A local level perspective. *Telecommunications Policy*, 31, 347–358.
- Yu, C. S. (2006). Exploring influences on Taiwanese e-marketplace adoption decisions. *Journal of Global Information Technology Management*, 9(2), 5-21.
- Zillien, N., & Hargittai, E. (2009). Digital distinction: Status-specific types of internet usage. *Social Science Quarterly*, 90(2), 274-291.

Appendices

Seeking interview participants

who are non- or infrequent users of the internet



If you are any of the following:

- Spend less than an hour a week online
- Do not have a smartphone
- Do not use the computer for work
- Do not have home internet subscription
- Only use the internet via my mobile device

I am looking for people who are non- or low users of the internet and computers for a research study. If you are interested in the study, please feel free to contact the researcher below.

Researcher : Jee Young Lee (Jee)

Phone XXX XXX XXX

Email: jee.lee@canberra.edu.au

Appendix 2: Participant information sheet for participants

Participant information sheet for participants

Dear interview participant,

I am a PhD student from the University of Canberra. I am trying to find out more about why you and other people do not use the internet and how you and other people think of the usefulness and benefits of the internet. Specifically, I want to find out how the internet and digital technology can be employed by those who need it for improving their lives. The results of the interview will help me learn more about the internet non-user's needs and perception. I hope that my research will determine and promote the most effective strategies to help people take advantage of the internet and digital technologies.

Our conversations will be recorded and transcribed and will last about one hour. You will be interviewed individually and I will not be seeking information on any other topic. I will maintain absolute confidentiality over all information collected.

Your participation is entirely voluntary and you may withdraw from the study at any time. You are not required to answer all the questions asked during the interview.

I would like your permission to talk with you about the internet. Please indicate below whether you give your consent to participate in our research.

Jee Young Lee

University of Canberra Bruce ACT 2601

XXX XXX XXX

Email: jee.lee@canberra.edu.au



**UNIVERSITY OF
CANBERRA**

AUSTRALIA'S CAPITAL UNIVERSITY

www.canberra.edu.au

Postal Address:

University of Canberra ACT 2601 Australia

Location:

University Drive Bruce ACT

Australian Government Higher Education Registered

Provider Number (CRICOS): 00212K

PARTICIPANT INFORMATION SHEET

What is this study about?

The study is about why people do not use the internet and how the non-users think of the usefulness and benefit of the internet. This research, particularly, focuses on how the non-users perceive the benefit and usefulness of using the internet and what are their needs of the internet and digital technology for improving their lives. In this digitalised society, there are still groups who are digitally excluded in any ways, such as individual, financial and social factors. Therefore, it is very important for our society to find out the critical factors which can hinder effective use of the internet and reducing the digital gap.

Who is carrying out this study?

The study is being conducted by a PhD student who is an experienced interviewer.

How much time will the study take?

The interview will take about an hour.

Can I withdraw from the study?

Participation in this study is entirely voluntary. You are not obliged to participate and – if you do participate – you can choose not to answer any of the questions in the interview and/or you can withdraw at any time without prejudice or penalty.

Will anyone else know the results?

All aspects of this stage of the study, including results, will be strictly confidential and comply with the provisions of the Privacy Act (1988). Only the researchers will have access to information on participants except as required by law. A few academic papers on the study will be published by the researchers on the relevant academic journals, but individual participants will not be identifiable in the reports. Nor will they be identifiable in any reports that may be publicly released in the future.

Will the study benefit me?

While the study will not benefit you directly, it is intended to benefit the wider community, academics and the Governments by creating a better understanding of non-users' experiences with digital technology and the Internet.

Can I tell other people about the study?

Yes, you may tell other people about the study. If they would like further information about the study they can contact with the researcher who is conducting the study whose details are shown below.

What if I require further information?

When you have read this information, a trained interviewer who is conducting the interview will discuss it with you further and answer any questions you may have. If you would like to know more at any stage, please feel free to contact the researcher, email: jee.lee@canberra.edu.au or phone XXX XXX XXX.

If you need emotional support and/or professional counselling, please contact:

NSW & ACT : Lifeline Telephone Service

13 11 14, www.lifeline.org.au

This information sheet is for you to keep.

Appendix 3: Participant Consent Form

Participant Consent Form

PARTICIPANT CONSENT FORM

I,[PRINT NAME], give consent to my participation in the research project.

In giving my consent I acknowledge that:

- The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.
- I have read the Participant Information Statement and have been given the opportunity to discuss the information and my involvement in the project with the researcher.
- I understand that I can withdraw from the study at any time.
- I understand that my involvement is strictly confidential and no information about me will be used in any way that reveals my identity.
- I understand that being in this study is completely voluntary –I am not under any obligation to consent.
- Please check the box if you would like to receive information about the research results. If so, where do you want the information sent to?

postal address:

Signed:

Name (print):

Date:

Appendix 4: Interview protocol

Interview protocol

1. Introduction

10 min.

Thank you very much for this opportunity to have an interview with you. Before starting, I would like to let you know that there is no right or wrong answers, and I am only interested in your thoughts and opinion. Everything you say in the interview is kept completely confidential.

I have a number of discussion points to cover today, and hope to finish in one hour. Please ask any questions throughout the interview, at any time.

2. Everyday lives and media (newspaper, books, TV, radio and other)

15 min.

I would like to start talking about your everyday lives.

- Would you please describe your daily lives and activities? (including working)
(For example, in the morning normally I do something...)
...watching TV, listening to the radio, reading newspaper/magazine/books, doing other hobbies or interests, playing sport, dancing, doing other hobbies or interests
- Talking / spending time with your friends, colleagues or family, others? (FTF, via phone)
- Volunteering, social clubs, attending in social programs and Learning and education
- How much time do you spend on each of these things during a normal week or weekend?
- Of which you said about your daily activities, how often would you say you come into contact with the Internet or computer devices?
(Such as desktop, laptop and other mobile devices – smartphone, tablet PC, etc.)
- Any other places (public places – local library, community centre, bank, school, etc.)
- Generally speaking, how much would you say you are related to the internet in your everyday lives?
- If compared with others?

2. Needs in a digitalised society

20 min.

I would like to start talking about your internet experience.

[Prior experiences with the internet /opportunities]

[For interviewees who have never used]

- Why would you say you have never used the internet?
- What have you ever heard about the internet? Please tell me anything you have.
- What do you think about that you heard about? (positive, negative...indifference)

[For interviewees who have ever used before or use intermittently]

- What have you used the internet for? When? How often?
- How did you start to use those things?
- How long ago was it that you stopped using the internet?
- Why would you say you stopped using the internet? (or you do not use the Internet often?)

[Awareness of necessity of the internet use]

- How often would you think you are asked for something related to the internet or other digital devices?
(For example...)
- When you are asked those things, how do you feel?
- Of occasions which you said, what is it to make you feel necessity or importance of the internet use most? Why would you say?
- Currently, or in the near future, is there anything you have to do something?
(For example...)
 - If you have, how would you do for it?
 - When you do something for it, have you ever felt something like uncomfortable, annoyed, that you are wasting time, or anything else?
 - Do you know how to use the internet for it? Or have you ever heard/seen about online tools for it?
 - Do you think there are some alternative ways which can be more comfortable, easy, simple (online)? Why would you think that?

3. Perceived benefits and risk of the internet

10 min.

I would like to talk more about the internet use.

- Have you seen/heard of usefulness of using the internet or other digital devices like smart phones? On what occasions?
 - What do you think are the most useful aspect of using the internet?
- On the other hand, have you seen/heard of negative aspects of using the internet or other digital device? What occasions?
- How useful would you say the internet or digital technologies are for your daily lives or activities?
 - How useful would you say the internet or digital technologies are for the important things in your life?
- What do you think of the impact of using/not using the internet on opportunities for something related to your life, *such as...*
- What barriers do you see to using the internet?
- How do you feel that you have to use the internet or get access to the internet at home?
 - Are you planning to get access to the internet in near future?
 - Why would you think that?
 - Nevertheless, what would you think are difficulties to start using the internet?

Summing up

5 min.

Thank you all very much for your time today.

Appendix 5: A example initial coding 1: Louise

Initial coding data full interview for thesis - Microsoft Excel

ID	TEXT	Code	content	context	sub-category	category	compare
19	Participant: It was actually last July. My son had a small operation in a hospital; I was waiting and just found a brochure and read..it was about the digital hub. This is how I found. And then, I came to the library and they booked me for the first lesson how to start...it's by accident. I remembered when they open the library, it's local newspapers about internet I just cut the information and put it away...and I found it again in the hospital. That's amazing. So, you know sometimes everything happen for reason.	17	brochure/advertisement newspaper about digital hub	she found the resource and tried (visit, book) by accident	Channel and motivation	learning experience	
20	Before, I used to be sitting next to my husband at home and watching and using together, he was main person using the internet, emailing, finding some information...so I was not independent and I always attach someone using it.	25	being used to rely on husband in using internet	Always needing someone helping me	feeling being dependent	Feeling about non-use	
22	Participant: Because I found...I was full-time mother, no working, so not have exposure to the technology, always busy with another things and just was not pay attention...and then, I found watching my friends using the internet, for me, I thought no choice...I can't live any longer without that	25	Feeling left behind by not using internet	as a full time mom with no time to fouse on myself/ finding everyone using internet	Feel using		time about
23	and then, you know, previously, I went to Poland to visit my family, I couldn't be in touch by email, because I didn't know how to use it. They sent email and use computer. Now, last time when I went, even waiting in airport in Singapore, I sent them emails it was for free. Just waiting for connection flight, It's surprising.	4	Realising changes of life by the internet				
24	You know, previously, I went to Poland to visit my family, I couldn't be in touch by email, because I didn't know how to use it. They sent email and use computer. Now, last time when I went, even waiting in airport in Singapore, I sent them emails it was for free. Just waiting for connection flight, It's surprising.	12	Enjoying using compter in the airport	She found resource available and used it for email			
26	Participant: Yes, definitely, every month, still my friends, they are on Facebook, I am not yet. (Would you like to learn about that?) Yes, Yes, one day, but you know, learning Facebook will be next step, first sending email...learn more about email (functions), more things I can use more frequently.	9	Hierarchy of learning process?/familiarity	I want to learn but first I need to be famillar to basic...			
28	Participant: I have my own laptop now, we have wifi connection, and also we have another desktop. When I am doing banking I am using the normal (the desktop) because of the security.	5	Security issue				
30	Participant: My husband and of course, my children, but they have their own laptop because, every 3-4 years changed. When my daughter started high school even they have no text books and everything was on laptop. This was year 7, it was like choice. You can be in class when they use just traditional way, books, papers, or everthing on laptop. But it was 10 years ago...I remember, it was very expensive laptop the school provided.	3	Change of schooling (to electronic books) and	how affordable parent are is important --> this is where			phenomenon/exclus

Memo: Many recourses are available around people but how many people can percieve and employ such resources? How many people think such things relate to themselves? Whether or not we can use recourse available for our purpose is also exclusion or inclusion because we need to think where the facilities are accessible/available? including customer services

Memo: Is there hierarchy in learning internet? does everyone think so? If so, what determines the hierarchy? Does it depend on how difficult the task is? Or emailing is lower level than Facebook? (content/service) sending emailing is lower level than attachment? (function complexity?) Familiarity?

Appendix 5: A example initial coding 2: Scarlet

Initial coding data full interview for thesis - Microsoft Excel

ID	TEXT	Code	content	context	sub-category	category	compare
22	Participant: I did when I had a computer. Several years ago, I got a computer to my grandchildren. And Sue went through sort (cleaned). It was just an old computer my other daughter had. (8:57-9:04)	15	Daughter using internet		family encouragement	initial access/use	This is the way in which non-users started to use it
24	Participant: I think they don't use it we don't use the internet because we don't have enough instruction or we don't know where to go to get the instruction. I think nearly all of the people in this complex which is such a small percentage well I am the oldest haven't access to the instruction. That's why we don't use it.	1	Not having instruction				
25	See, De was already to give up so if you gave her the right instruction she would be using the internet she only had three lessons recently because her son said he was going to get her a computer, but there were problems. But she is quite capable learning the internet. She doesn't think so but I know she can.	1	If she(a friend) has right instruction, she would be using				
27	Participant: I did when I had a computer but then, Cabel(Friend) here a lot he helped me I need somebody to help. He's gone to Brisbane.	1	Needing somebody to help	I had a computer friend helped me, but he has moved and...	continuing support	reason for not using	
29	Participant: Well I give them @? and I get information back from the store, but it can be a bit of nescience (ignorance) too. When I got the phone, I gave it a lot of shops but I don't give it out so freely anymore.	3	being more careful to give my email address out		Online presence but out of flow of information	phenomenon/exclusion	
31	Participant: Just trial and error, so that's why I am so bad at using it.	1	trial and error				
35	Participant: I went into Telstra with Sue (daughter), and I chose that one because it was size I could see without glasses, but Sue got a much better provider for herself now she said last night when I was talking to her that as soon as this contract resign we going to have that one.	15	buying smartphone because of its big screen				
36	Interviewer: At that time, I wonder the salesman explained something to you, such as good things...						
37	Participant: Nothing Just the contract. You know they promised the world and (they) Telstra is worst						
39	Participant: Occasionally you will get somebody that's good, but everyone you get (its good) I have taken this no one couldn't fix it because it's obviously (a hard) problem. But, they didn't even try they just said "Oh, Gmail account we can't do it". That was their story; I am really interested in going with you and (bow) them out on it) because they just didn't even try.	3	The staffs of Telstra didn't fix the problems and busy trying to pass it to others	a lack of instruction : service providers should have adequate instruction (not just for selling products)	a lack of instruction of service provider	phenomenon/exclusion	
41	Participant: True, I have two people in Telstra that I respect their help but any other time they're helpless.	3	they(service provider)'re helpless.			phenomenon/exclusion	

Memo:
Lesson for market : It is not only thing for gov. Increasingly customer provides email address but if the users are not fully connected or false users. It is no use.

Memo:
Do we really regard them as an online user?

Memo:
taken for granted attitude of sellers/ providers customers who are not really skilled users are excluded any way in market in particular no supporting is problem I added this in the exclusion category because it allow me to go deeply to understand the holistic exclusion picture

Appendix 6: Codebook

code	category	sub-category
1	lifestyle/media consumption	
2	reasons for non-use	
3	experience of use	
4	being excluded	
5	perceiving benefits of internet use	
6	perceiving risk	
7	perceiving barriers	
8	future adoption	
9	family using the internet	
10	needs for use	
11	reasons for use	
12	others	
13	resource available (awareness)	accessing public facilities
14	motivations	
15	initial access/use	
16	feeling about other around me	observing neighbours using internet
17	learning experience	obtaining basic skills from work
		obtaining basic skills from local libraries
18	family support	
19	hesitating to ask for help	
20	resulting positive feeling	
21	feelings associated with exclusion/deprivation	feeling pressure to use/start
		feeling missing out
		feeling not well connected to everyone
		feeling being excluded
		not wanting to left behind
		expectation that everyone use it
not wanting to left behind		
22	limited use of the internet	
23	working related use of the internet	
24	being discouraged	family discouragement
25	feeling about non-use	
26	observing changes	education
		social system/automated system
		young people
27	having several devices at home	
28	needs for training course	
29	feeling about technology	