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MOVING FORWARD ON DIGITAL INCLUSION: A FRAMEWORK FOR INTEGRATING RESEARCH, POLICY AND PRACTICE

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ABSTRACT

Moving Forward on Digital Inclusion: A framework for integrating research, policy and practice
The concept of a technological divide is frequently employed to discuss and analyse the social
inequities that exist in relation to the use of technology. These disparities occur across local, regional,

national and international levels of society and consequences include the reduction of people's ability to participate in the information economy. This paper reflects on the *Framework for Inquiry into the Technological Divide;* a social work framework to facilitate understanding and provide direction to research, policy and practice targeted at closing the technological divide. Application of the framework is discussed in light of a recent study carried out in the Northern Territory of Australia that investigated the presence of a technological divide at the care nexus of people with dementia, carers and practitioners. A summary of broader applications of the framework is also presented.

KEYWORDS

Technological Divide, Digital Inclusion, Social Work, Dementia, Carers

SAMENVATTING

Voorwaarts richting digitale inclusie: Een kader om onderzoek, beleid en praktijk te integreren
Het concept "Technological Divide" wordt vaak gebruikt om sociale ongelijkheden te analyseren, die betrekking hebben op het gebruik van informatie- en communicatietechnologie. Deze ongelijkheden komen op lokaal, regionaal, nationaal en internationaal niveau voor en belemmeren onder andere de mogelijkheden die mensen hebben om deel te nemen aan de informatiesamenleving. Dit artikel reflecteert op het *Framework for Inquiry into the Technological Divide*. Dit *framework* geeft richting aan onderzoek, beleid en uitvoeringspraktijken die deze technologiekloof willen dichten. Het artikel bespreekt de toepassing van het framework in het licht van een recente studie, uitgevoerd in het Noordelijk grondgebied van Australië, die de aanwezigheid van een technologiekloof onderzocht in de samenhangende zorg door professionals en verzorgers aan mensen met dementie. Ook wordt een samenvatting van de bredere toepassingsmogelijkheden van het framework gepresenteerd.

TREFWOORDEN

Technological Divide, digitale inclusie, maatschappelijk werk, dementie, verzorgers

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INTRODUCTION

The conceptualisation of a technological divide is based on notions that social inequities exist in relation to the use and optimisation of information and communication technology (ICT). These inequities manifest themselves in various forms both locally and globally. Particularly in recent decades social researchers have questioned technological inequity and attempted to establish theoretical frameworks to enhance understandings of human use of ICT, factors which influence this use and the consequences of not using technology. Through her own research and drawing on prior thinking West (2006) introduced the *Framework for Inquiry into the Technological Divide*, a tool for understanding the complex causes and effects of differing use of technology and the development of theory and practice interventions to address the technological divide.

At the time West (2006) largely focused on describing the components of the *Framework for Inquiry into the Technological Divide* and their integrated relationship. This discussion was then contextualised to research which focused on the benefits and challenges of introducing older people to ICT. In light of continuing international dialogues around the causes and effects of ICT related inequality the purpose of this article is to revisit the framework in the context of a new study which the authors have conducted in the Northern Territory of Australia. In doing this a proposal will emerge for the wider utilisation of the *Framework for Inquiry into the Technological Divide* which captures the variety of often unacknowledged factors that underpin the technological divide and is designed to inform research, policy and practice. The authors aim is therefore to contribute to the ability of international researchers, policy makers, agencies and practitioners to understand, conceptualise and address technological inequalities in light of both their fields of practice and unique practice locations in a consistent and holistic manner.

Discussion will revolve around three key themes. Firstly, a social work perspective will be described for two principal reasons. The first of these is that a social work perspective is embedded within the *Framework for Inquiry into the Technological Divide.* Additionally, social work is concerned with identifying how disparate access levels and broader capacity to use resources such as ICT affect individuals, families, groups and communities and using this knowledge to inform interventions aimed at building capacity and creating social justice. There is an obvious synergy between discussions of social justice and notions of a technological divide. Secondly, the *Framework for Inquiry into the Technological Divide* will be presented with an accompanying synopsis. Finally, the authors will summarise the present study which applied the framework

to investigate – from the perspective of dementia service practitioners – the presence of a technological divide at the care nexus of people with dementia, carers and practitioners. Particular attention will be directed at how the *Framework for Inquiry into the Technological Divide* guided the project from conception to analysis. The paper will conclude by drawing together these themes to clearly articulate what the framework has to offer in terms of improving future research and practice.

THE SOCIAL WORK PERSPECTIVE

Whilst a social work perspective may be familiar, its usefulness in the context of analysing technological inequality should be explained. Although a complex philosophy underpins social work it is largely defined by a person-in-environment focus (Australian Association of Social Workers (AASW), 2002; Bartlett, 1972). This means that social workers typically attempt to understand and work with people to resolve problems through developing shared understandings of how individuals and various groups interact and conduct transactional relationships with elements of their environment. The aim is then to look at how these interactions can be improved via various interventions. Consequently, holistic analysis is a driving force and strength of the social work perspective, however its strength is liable to be compromised when available research and theory is either lacking or has been developed inconsistently and/or incompatibly. When considering a pervasive and multi-dimensional phenomenon such as international ICT usage these issues are amplified.

Over time social work, globally, has responded in various ways to the challenge of developing knowledge that reflects both the social experience of individual human beings and broader environmental, political and structural interplay. One method has been to stress the importance of both qualitative and quantitative research (Babbie, 2004). Another way has been for social work to emphasise practice across various levels. Practitioners in micro practice work directly with individuals or small groups. Those at the mezzo level work at the organisational, large group and community level. Practitioners at a macro level typically work with broader social policy and social research. The social work values of respect for human dignity and worth, service to humanity, integrity, competence and social justice guide social workers at these various levels and give them a sense of common purpose, in part, "a commitment to the pursuit and maintenance of human wellbeing" (AASW, 2002, p. 5).

Given that social justice principles can be applied to basically all social aspects of human life, out of necessity social work is characterised by theoretical pluralism. This has evolved into a knowledge

base constructed from sociology, psychology, anthropology, other related disciplines and social work itself. In part, this helps social workers develop the specific knowledge bases attached to the various fields of practice and accompanying concepts with which they work. Finally, social work emphasises the use of heuristic tools such as a systems perspective (Hearn, 1974; Payne, 2005) and the empowerment approach (Lee, 1994), which are employed to train practitioners to practice in a consciously integrative fashion – that is to facilitate a better "fit" between individual needs and environmental, political, economic and structural dynamics.

Clearly this is not new information, however it is essential background to a discussion about how social workers and others can work to ameliorate the negative effects of digital exclusion. Digital exclusion comes in many forms but can broadly be described in this context as comparative or relative limitations in any combination of technological access, knowledge, awareness, learning opportunities, support and/or skills. However, much of the research and policy that is generated continues to address only one or two of these elements that influence the use of technology. While this has moved on from the early binary notion of whether one has access to a computer (e.g. see Hargittai, 2002), frameworks have remained too limited in focus from a holistic social work perspective.

Globally, one of the many human consequences of technological exclusion is inequitable ability to participate in the information economy (Castells, 2000; Macionis & Plummer, 2005; National Office for the Information Economy (NOIE), 2002; Organisation for Economic Co-operation and Development (OECD), 2001; West, 2006). This translates into reduced access to the educational, financial, occupational, communicational and social resources which have seen computer literacy become increasingly recognised as a third essential life skill alongside literacy and numeracy (Department of Communication, Information Technology and Arts (DCITA), 2004). In the simplest sense, a social work task is to collaboratively promote people's ability to use technology so that they can access the increasing range of resources available, which, as the framework will illustrate, entails interventions to increase ICT access, knowledge, awareness, learning opportunities, support and skills.

THE FRAMEWORK FOR INQUIRY INTO THE TECHNOLOGICAL DIVIDE

It is abundantly clear that ongoing improvement in understanding and addressing a technological divide is dependent on researchers, policy makers and practitioners structuring their inquiry

and analysis in a complimentary and useful fashion. Across numerous fields of practice that are the subject of research by social workers and social researchers one routinely finds examples of research studies that although useful in their own right and own location are hampered by difficulties in comparing the findings to other research. The increasing emphasis placed on systematic reviews and meta-analyses as research tools has revealed this problem more fully. One of the most frequent criticisms is that researchers neglect to clearly articulate the theoretical framework that underpins their research (Jacobs & Prigerson, 2000; Kato & Mann, 1999; Marshall & Hutchison, 2001; Marziali, Dergal & McCleary, 2005). A theoretical framework is essential because it acts as a vehicle to define concepts and illustrate how given research fits with and then builds on existing knowledge.

Although the individual consequences of digital exclusion may vary depending on personal, regional, cultural factors and the like, the *Framework for Inquiry into the Technological Divide* provides a versatile and comprehensive theoretical framework applicable to various populations at both local and international locations. It is a framework that researchers can use to remotely but nonetheless collaboratively improve aetiological knowledge of a technological divide and better inform research and subsequently social interventions at various levels of practice. In light of a social work perspective the net goal is to globally improve the social justice outcomes that are associated with digital exclusion. The framework is depicted below as Figure 1.

As the framework was explained in an earlier publication (West, 2006) only a brief overview will be provided here. The framework itself is divided into three sections. The column on the left – "fifocal vision" – is adapted from Lee's (1994) work and represents five elements which are seen to be central to understanding the power relationships which affect different individuals and groups and wider society. Power is connected to the technological divide because "knowledge about and use of technology is associated with power and … blocks to power are imposed and compound to create further disadvantage" (West, 2006, p. 6). Broadly grounded in the social work perspective and more specifically in the Empowerment Approach to Social Work Practice (Lee, 1994), fifocal vision represents a critical analysis mechanism that performs two vital functions. Firstly, it places the technological divide in its socially constructed context and secondly it helps to locate potential arenas for social interventions that address digital exclusion and remove blocks to power. The lenses of fifocal vision can be applied by international researchers and practitioners to critically analyse power imbalances experienced by specific populations in their specific location and practice context.

The middle third is titled "technological divide framework" and represents measurable concepts that allow disparities in technological utilisation to be universally researched and compared between and within groups. Each factor in this column influences the ability of people to fully utilise the capabilities of technology. These factors, viewed collectively, reflect how theorists have evolved notions of digital exclusion from initial conceptualisations based principally on access. The factors comprising the technological divide framework were identified as a result of three separate empirical studies featuring a total of 2345 participants (Irizarry, Downing & West, 2002; Irizarry, West & Downing, 2001; West, 2003a; West, 2003b). Understanding that access, knowledge and awareness, learning opportunities and support, and skills all contribute to the successful use of technology performs the dual function of helping researchers to pinpoint appropriate research questions and assisting practitioners at all levels to target social interventions at specific
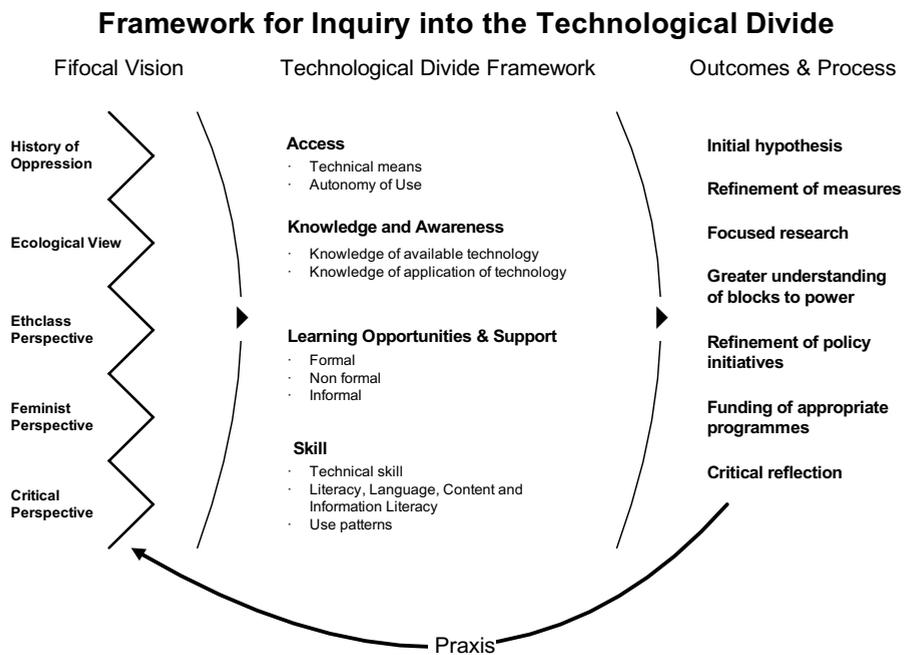
Framework for Inquiry into the Technological Divide

Figure 1: The Framework for Inquiry into the Technological Divide.

components of a technological divide. Fifocal vision and the technological divide framework are inherently linked and can be applied by international researchers and practitioners to their specific location and practice context. Basically, fifocal vision is a means to analyse why measured disparities exist between certain individuals and groups while the technological divide framework represents an expanded version of the measurable factors that are more traditionally identified in relation to the digital divide.

The right hand column entitled "outcomes & process" represents the practical application of the framework in the context of the broader goal to globally improve the social justice outcomes associated with digital exclusion. This translates into a sustained, long term process of identifying and intervening to close gaps in the technological access, knowledge, awareness, learning opportunities, support and skills of different people and groups. Derived from an evidence based practice model (Gambrill, 2001; McDonald, 2006) a notable feature of this column is the conceptualisation of research, policy, practice and critical evaluation as a process to ameliorate a technological divide. This links intrinsically to prior discussion of the requirement to build on existing knowledge and address digital exclusion via an integrated and collaborative approach. Additionally, the praxis arrow at the foot of the framework reflects this by highlighting the spiralling nature of the model. Finally, this column also functions to assist individual researchers and practitioners to identify where their activities "fit" in light of the broader drive to close a technological divide.

RESEARCH USING THE FRAMEWORK: DEMENTIA SERVICE PRACTITIONERS

Having provided a general overview of the *Framework for Inquiry into the Technological Divide,* this section presents a case study showing how the framework can be applied to a research project in a local or regional area. For now it is sufficient to state that the study was underpinned by the *Framework for Inquiry into the Technological Divide,* and that the research question was: "according to dementia service practitioners at what level are the different items (access, knowledge and awareness, learning opportunities and support, and skills) in the technological divide framework present for people with dementia, their carers and service providers in the 'Top End' of the Northern Territory". After a brief literature review the study will be described in more depth and key points drawn together. It is important to note that the literature review has inherent links to "fifocal vision" because it represents a process

of critically identifying the specific barriers to digital inclusion faced by people with dementia and carers.

Literature Review

Dementia
Although information about dementia is widely available it is important that some basic information is presented here. Alzheimer's Australia (2005a) reports that dementia is a term that describes the symptoms of a large group of illnesses which cause a progressive decline in a persons functioning. There are a number of common forms of dementia including: vascular dementia, Parkinson's disease, dementia with Lewy bodies, fronto-temporal lobe degeneration, Huntington's disease and alcohol related dementia (Alzheimer's Australia, 2005a). By far the most common form
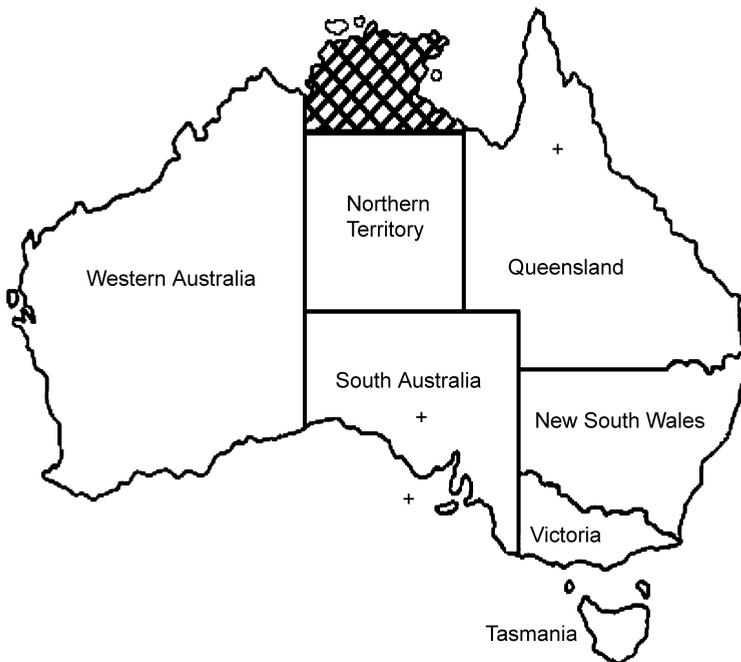

Figure 2: Approximate study area.

of dementia though, is Alzheimer's disease, which accounts for 50–70% of all cases (Alzheimer's Australia, 2005b).

Understanding the symptoms of dementia is important as they are a window to the potential support offered by ICT to people and carers affected by the disease. Dementia is a degenerative disease of the brain and symptoms progressively worsen or manifest themselves more overtly as the disease develops and brains cells either shrink or disappear (Alzheimer's Australia, 2005b; Roller & Gowan, 2007). The Australian Institute of Health and Welfare (AIHW) (2006) reports that 98% of older people with a severe or profound core activity limitation have dementia contributing to the limitation. The AIHW (2006) also reports that most people with dementia have other long term problems such as gait disturbance, slowed movement, fractures, arthritis, osteoporosis, and urinary tract infection; although for 67%, dementia is the main disabling condition. Clearly, dementia is a major potential barrier to high quality of life in later years.

Alzheimer's Australia (2005c) notes that the progression of dementia is generally classified according to three stages: early, moderate and advanced. Typical symptoms at an early stage include: general slowness and difficulty, trouble retaining new and recent memories and less concern about other people and their feelings. As symptoms worsen to moderate stage dementia frequent symptoms are: confusion regarding time and place, neglect of hygiene, neglect of other people, difficulty completing routine tasks and susceptibility to becoming lost in unfamiliar surroundings. Finally, at the advanced stage symptoms include: speech loss, incontinence, forgetfulness, inability to recognise even relatives, require help with the most basic tasks, aggression, wandering and uncontrolled movement (Alzheimer's Australia, 2005c; Roller & Gowan, 2007).

Sweeting and Gilhooly (1997) and Kirkman (2006) observe that dementia is often experienced as a "social death". The symptoms described above all reflect dementia's devastating effect on people's quality of life. As a consequence carers and loved ones often describe a feeling that the body is still there but the person they knew has gone (Bull, 1998; Kirkman, 2006; Watts & Teitelman, 2005).

People with dementia, carers and practitioners – issues at the care nexus
In light of the nature of dementia as an illness, attention must be drawn to dementia care and the issues that are important in care. Wasow (1986) reported that generally caregivers resort to

nursing home placement only after they have physically and emotionally exhausted themselves. Not surprisingly then, stress, depression and anxiety are reported in the literature as major problems for both carers and the person being cared for (Gottlieb & Johnson, 2000; Kirkman, 2006; Watts & Teitelman, 2005). This strain has led to an issue arising which has been termed *elder abuse*, which is the physical or mental abuse of an older person, often by a caregiver. Elder abuse is a major problem for people affected by dementia as they lose their sense of identity and ability to relate, whilst carers may feel considerable stress and resentment from being a full time carer for someone who does not always show appreciation or have the ability to show appreciation for the received care (Alzheimer's Australia NT, 2002; Wasow, 1986; Watts & Teitelmen, 2005).

With carer stress a well recognised factor affecting the quality of a caring relationship, in Australia there has been a strong focus on respite care services. McGrath, Mueller, Brown, Teitelman, and Watts (2000, p. 54) describe respite as "any situation in which the care recipient is with another person or engaged in an activity in a perceived safe environment that provides the caregiver with a break from direct supervision". Researchers have found that respite services are under-utilised and that use is often to fulfil other necessary tasks such as shopping or paying bills (Gottlieb & Johnson, 2000). Watts and Teitelman (2005) studied 15 carers and supported this notion – in the process questioning how carers might actually achieve a "restorative mental break". Strang and Haughey (1999) have defined this concept for carers as getting out of the care-giving world and into their own world.

Despite symptoms of dementia eventually leaving people requiring total care; researchers must remember that touch, hearing and the ability to respond to emotion are all abilities that remain intact (Alzheimer's Australia, 2005c; Miller & Morris, 1993). Alzheimer's Australia (2007) also reports that about half of Australian people with moderate to severe dementia live in residential care, whilst the other half live in the community domain. Consequently, researchers and practitioners must investigate how technology might be used in various ways to improve the quality of life of people with dementia and carers in both community and residential care contexts. It is here that the relationship between people with dementia, carers and practitioners is vital.

ICT, carers and people with dementia – some potential applications
In light of practice specific knowledge regarding people with dementia and their carers, the literature identifies a variety of ways in which technology can potentially improve quality of life.

Some authors have investigated ways in which website design could be made more user-friendly for people with early stage dementia (Freeman *et al*., 2005; Nestor, Parasuraman & Haxby, 1991; Woods & Bird, 1999). This gives people with dementia increased chance of deriving the cognitive benefits associated with activities like computer use and therapeutic tools. Other authors make proposals for on-line support and social networking groups for carers (Alzheimer's Australia, 2007; DCITA, 2005; Marziali, Damianakis & Donahue, 2006).

Vanderheiden (2007) asserts that internet capabilities will significantly enhance assistive technology in the near future. Assistive technologies can enhance accessibility and improve the way people with dementia safely negotiate daily tasks and their physical environment. Additionally assistive technologies can help carers to feel less anxious as they offer options for personal security and mechanisms to locate people who wander. Furthermore, simple devices such as motion sensors can help provide better sleep for carers (Cohen-Mansfield & Biddison, 2007).

Whilst the above are relatively specific applications of ICT with people with dementia and carers, the value of assisting people with dementia and carers to use technology more generally cannot be underestimated. Activities such as internet banking, paying bills on-line and ordering groceries on-line can free up time for meaningful respite activities. In addition, ICT can play a key role in facilitating easier communication with family and others. Finally, it must be remembered that basic ICT proficiency is an increasingly necessary pre-requisite for participation in various aspects of the information economy. Despite dementia posing clear barriers to successful use of technology the literature proposes a variety of modes in which employing ICT may improve the quality of life of carers and people with dementia.

Project Summary and Examples of Findings

The literature review leads to two fundamental assumptions. The first is that ICT exhibits potential to improve the quality of life of carers and people with dementia. The second is that dementia and carer service agencies have a key role to play in maximising this potential – this by virtue of their access to funding, technology itself, other resources, professional training, and expertise in the dementia care field. Little prior research has been carried out in the Northern Territory investigating the use of ICT to assist carers and people with dementia.

Therefore, this research needed to provide a logical starting point that would offer strategies going forward.

It was decided that the first step should be to survey dementia service practitioners and find out what they know about the ICT access levels, knowledge and awareness, learning opportunities and support and skills of carers, people with dementia and themselves. Practitioners were selected as the sample group for a number of reasons: firstly, because of the above described potential leadership role in facilitating the digital inclusion of carers and people with dementia; secondly, because using research subjects with dementia is difficult from an ethical standpoint; thirdly, for cost reasons; fourthly, because it was anticipated that the findings would be helpful to agencies and practitioners, and by association, carers and people with dementia; and finally, because any findings gathered would be useful to compare if later studies are carried out directly with carers or people with dementia.

It must be made clear that this study was not based on the assumption that practitioners' views necessarily represented the reality for carers or people with dementia, but that their knowledge of issues in the field represented a logical starting point at a local level. Indeed, if future research with people with dementia or carers finds significant discrepancies between their views and practitioner views, local interventions aimed at raising practitioner awareness of client views could be useful. This project is therefore one part of the ongoing process identified in the right hand third of the *Framework for Inquiry into the Technological Divide*.

A purposive snowball sample of 61 dementia service practitioners from 22 of the 26 approached agencies participated in the study. The twenty-six agencies were identified via community service directories and via referral from participating practitioners. Whilst in research terms this could be considered a small sample, in reality the total population in the research area is approximately 130,000 people spread over a vast area. In a specialised field like dementia and carer support service there is a limited number of practitioners to draw upon. Rather than the sample size, which will never be statistically ideal in such a remote part of Australia, the fact that practitioners from 22 of the 26 approached agencies participated in the study indicates some measure of representativeness.

Participation entailed completing a quantitative questionnaire that asked questions about practitioners own ICT access, knowledge and awareness, learning opportunities and skills, as well

as that of carers and people with dementia. What follows are examples of findings from each of the sections.

A series of questions were asked about agency provided *access* levels of practitioners to different telephone and internet devices. The study found that 87.8% of practitioners had access to the internet at work and over 98% had access to a telephone. Practitioners were also asked about their perceptions of the access levels of carers and people with dementia to telephone and internet devices and how these compared to the general population. The findings are shown in Table 1. The findings suggest that one reason practitioners might not fully utilise ICT with carers or people with dementia is because they do not believe clients have access. In addition, whilst the findings are not conclusive they suggest further research should be carried out directly with carers and people with dementia to ascertain more accurate access levels. Such research would then provide an evidence base for social policy responses and help individual practitioners to become more aware of access levels.

Table 1: Practitioner perceptions of access levels of people with dementia and carers to ICT devices (*n* = 57).

ICT Device & Group	Perceived access level compared to the general population				
	Less (*n* =)	Similar (*n* =)	More (*n* =)	Unsure (*n* =)	Total
Telephone Access of Carers	21.1% (12)	63.2% (36)	8.8% (5)	7.0% (4)	57
Internet Access of Carers	43.9% (25)	42.1% (24)	5.3% (3)	8.8% (5)	57
Telephone Access of People with Dementia	52.7% (29)	34.5% (19)	0.0% (0)	12.7% (7)	55
Internet Access of People with Dementia	73.7% (42)	8.8% (5)	0.0% (0)	17.5% (10)	57

A series of questions were asked about different aspects of *knowledge and awareness* of ICT. These included questions that measured practitioner awareness of the different ways in which literature suggests ICT might be employed to improve the quality of life of people with dementia and carers. Questions were also asked about how practitioners thought technology could improve their own practice. Whilst full discussion of these findings is beyond the scope of this paper, the results provided information about ICT applications where practitioner knowledge and awareness could be raised. This is based on the premise that if practitioners are not aware

of or confident in using the variety of ICT applications they may not explore all options for working with clients. Table 2 shows the nature of findings generated by one of the questions relating to knowledge and awareness. In effect, these findings illustrate practice areas in which the knowledge and awareness of practitioners might be raised to improve and/or expand interventions.

Table 2: Practitioners perceptions about how ICT can improve the quality of life of people with dementia (n = 59).

Way of Improving Quality of Life	Yes (n =)	No (n =)
Communication with family and others	74.6% (44)	25.4% (15)
Keeps the mind active	67.8% (40)	32.2% (19)
Contact with helpful organisations	67.8% (40)	32.2% (19)
Social networking and informal support	64.4% (38)	35.6% (21)
Easier communication with carer	55.9% (33)	44.1% (26)
Personal security (e.g. locating people who wander)	55.9% (33)	44.1% (26)
Reminding people of things that need doing	52.5% (31)	47.5% (28)
Creating and maintaining life memory stories	52.5% (31)	47.5% (28)
Reducing anxiety when separated from carer	50.8% (30)	49.2% (29)
On-line support groups	50.8% (30)	49.2% (29)
Self-confidence from learning new skills	44.1% (26)	55.9% (33)
Assistance in daily tasks	42.4% (25)	57.6% (34)

Under the "technological divide framework" it is acknowledged that *learning opportunities and support* for using ICT occur in variety of different formal, informal and non-formal ways. It is also prudent to recall that one of the pivotal assumptions of the project is that enhancing the use of technology with people with dementia and carers will require agency leadership and resources. With that in mind consider Table 3 which illustrates practitioner's current training with different ICT applications, their desire to have more training and whether they feel they have the resources available to complete such training. This information can contribute to agency policy in relation to the ongoing professional development of staff. In addition these data can be linked to practitioner's knowledge, awareness and skills relating to using ICT specifically in their practice with carers and people with dementia.

Table 3: Practitioners previous use and perception of learning opportunities related to ICT skills (*n* = 59).

ICT Based Activity →	Using the internet	Telephone counselling	Facilitating on-line therapy and support groups	Website design and management	Teaching people how to use the internet
↓ Types of Learning	Yes Responses (*n* =)				
Has had formal training	40.7% (24)	15.8% (9)	5.1% (3)	5.1% (3)	3.4% (2)
Has had training but less formally e.g. asking colleagues or friends	64.4% (38)	28.8% (17)	15.8% (9)	15.8% (9)	25.4% (15)
Would like more training	40.7% (24)	40.7% (24)	40.7% (24)	42.4% (25)	28.8% (17)
Felt training in this would be valuable	30.5% (18)	35.6% (21)	37.3% (22)	25.4% (15)	20.3% (12)
Felt the agency would support them in further training	37.3% (22)	33.9% (20)	30.5% (18)	23.7% (14)	22.0% (13)
Felt training is available locally for this skill	44.1% (26)	25.4% (15)	18.6% (11)	25.4% (15)	20.3% (12)

A series of questions were also asked in relation to what perceived *skills* practitioners had in using ICT to facilitate various activities and the frequency with which they conducted various ICT based activities in their practice with carers and people with dementia. Whilst most practitioners felt comfortable using the internet for general activities like surfing and e-mail, very few practitioners felt they had the skills to use the internet to conduct formal therapeutic activities like support groups or counselling. As the technological divide framework suggests, this can in part be attributed to the fact that practitioners rarely "do" these things, as Table 4 illustrates.

Finally, integrative questions were asked in which information inherently relates to all four key areas of the technological divide framework. An example is the question which asked practitioners what they perceived to be the barriers to using ICT to improve the quality of life of people with dementia. These findings are displayed as Table 5. Particularly important is to look at the left

Table 4: Frequency with which practitioners conduct selected types of internet based activity (*n* = 58).

Internet based activity	Frequency practitioner conducts activity				
	Not at all (*n* =)	Rarely (*n* =)	A few times a week (*n* =)	Daily (*n* =)	Total (*n* =)
E-mail to colleagues in own agency	23.2% (13)	8.9% (5)	14.3% (8)	53.6% (30)	100% (56)
E-mail to other agencies	25.9% (15)	6.9% (4)	19.0% (11)	48.3% (28)	100% (58)
Information/resource gathering	10.7% (6)	23.2% (13)	42.8% (24)	23.2% (13)	100% (56)
Use the agency website to convey information to clients	48.3% (28)	34.5% (20)	13.8% (8)	3.4% (2)	100% (58)
E-mail to clients in remote areas	63.8% (37)	24.1% (14)	10.3% (6)	1.7% (1)	100% (58)
Conduct on-line counselling	77.6% (45)	17.2% (10)	3.4% (2)	1.7% (1)	100% (58)
E-mail directly to carers	39.3% (22)	39.3% (22)	25.0% (14)	0.0% (0)	100% (56)
Teach clients how to use the internet	78.6% (44)	16.1% (9)	5.4% (3)	0.0% (0)	100% (56)
E-mail to people with dementia	73.2% (41)	26.8% (15)	0.0% (0)	0.0% (0)	100% (56)
Facilitate on-line support groups	92.8% (52)	7.1% (4)	0.0% (0)	0.0% (0)	100% (56)

hand column which indicates which key area or areas of the technological divide framework that particular response is connected to. These questions provide a mechanism for both triangulating data for reliability purposes and summarising data in light of a theoretical framework such as the *Framework for Inquiry into the Technological Divide.*

It is essential to be clear that the objective of this case study has not been to fully describe the project investigating ICT and dementia care in the Northern Territory, rather to illustrate the application of the *Framework for Inquiry into the Technological Divide* to research with a specific population. It must also be made clear that only some of the findings and a summary of the

Table 5: Practitioners perceptions of barriers to using ICT to improve the quality of life of people with dementia (*n* = 57).

Relevant area	Barrier	Yes (*n* =)	No (*n* =)	Total (*n* =)
Access	Expensive for person to purchase technology	80.7% (46)	19.3% (11)	100% (57)
	Limited ICT resources in remote communities	70.2% (40)	29.8% (17)	100% (57)
	Expensive for agencies to purchase technology	54.4% (31)	45.6% (26)	100% (57)
Learning Opportunities and Support	Dementia symptoms making ICT use difficult	87.5% (49)	12.5% (7)	100% (56)
Knowledge and Awareness	Fear of new technology	77.2% (44)	22.8% (13)	100% (57)
	Lack of awareness of the benefits of ICT	64.9% (37)	35.1% (20)	100% (57)
	There is a current lack of helpful technology	28.1% (16)	71.9% (41)	100% (57)
	ICT has limited potential to help people with dementia	19.3% (11)	80.7% (46)	100% (57)
Skills	Limited general ICT skills of people with dementia	75.4% (43)	24.6% (14)	100% (57)
	Lack of ICT trained facilitators in agencies	59.6% (34)	40.4% (23)	100% (57)

method were presented. Readers with a particular interest in the local findings as they relate to carers and people with dementia can access the full research report (Heath, 2008) at http://www. santdtsc.edu.au/media/docs/davidheath_final_report_nov08.pdf.

Given that the findings explicitly relate to a local area, the authors have only provided a summary of the project, it should nonetheless be clear from the given examples that the *Framework for Inquiry into the Technological Divide* played a critical role in the conceptualisation of the research project and materials and will underpin further research directly with carers and people with dementia as well as research with practitioners that has a stronger qualitative focus. Discussing

findings relating to technology use in terms of access, knowledge and awareness, learning opportunities and support and skills is a good way of helping researchers, policy-makers and practitioners identify ongoing activities that can promote the digital inclusion of carers and people with dementia at a given local or regional level. Furthermore, international researchers and practitioners can derive benefit because such a framework provides a basis for comparison with their own research and practice in dementia care and/or with other groups at risk of digital exclusion.

SUMMARY OF FRAMEWORK APPLICATIONS

In commencing this paper, the authors suggested that the *Framework for Inquiry into the Technological Divide* had much to offer when it comes to research, policy and practice that closes a technological divide and promotes digital inclusion. On one level the case study demonstrated the specific application of the framework to research linking dementia care and the technological divide, however the major strength of the framework in the international arena is its universal nature. The paper will conclude with articulation of how the framework can be applied in a more general sense, giving workers in different arenas something to enhance their own practice with a technological divide.

Research

In a theoretical sense, the *Framework for Inquiry into the Technological Divide* helps researchers to explore a technological divide comprehensively and beyond binary notions of access or non-access. With an empirical grounding that builds on prior thinking, the framework provides a rigorously developed conceptualisation that can be used to compare and contrast research emerging from different populations, physical locations and fields of practice. This is vital in light of the previous observation that one of the traditional shortcomings of social work research has been the omission of clear theoretical frameworks.

The framework also represents both a tool for researchers and social research educators because it demonstrates the ongoing process of building a research informed knowledge base around a technological divide. The best example of how this works is by referring back to the dementia research case study. From that particular study a range of further research projects have been identified. Local research directly with carers and/or people with dementia would be useful especially to compare to the current study. Research with practitioners and agencies in different

locations would also be useful, as would research in different practice fields. The end result is a better understanding of how a technological divide – that is inequities in the access, skills, learning opportunities, support, knowledge and awareness required for the optimal use of technology – manifests itself across local, regional, national and global societies.

Policy

This improved understanding of factors that contribute to a technological divide is fundamental to creating better social policy to address digital exclusion. Once again referring back to the dementia research case study provides examples of how the framework helps identify avenues for policy. Whilst local agency access levels to ICT devices are good, practitioners require additional training and support to use the devices more fully. Similarly, benefits might also be found in raising the knowledge and awareness of staff about some of the lesser known applications of ICT with carers and people with dementia. At a broader level, the *Framework for Inquiry into the Technological Divide* assists in pinpointing gaps in the knowledge around use of technology. For policy makers, this translates into the ability to target research funding and resources more precisely toward areas of most promise.

Practice

In direct practice, the framework offers agencies and practitioners a mechanism for auditing their utilisation of technology and critically appraising what steps they can take to address digital exclusion. Among other things, these steps could include: further training for staff in using ICT generally and in the context of a specific practice field; research at an agency level; purchase of new technology; employment of staff members specifically to maintain and enhance technological capacity; programs using ICT capabilities; and, dissemination of information about agency use of ICT to the wider research, policy and practice community. This last point illustrates the spiralling "praxis" nature of the *Framework for Inquiry into the Technological Divide*, emphasising inclusive and collaborative building of knowledge rather than traditional "top-down" approaches.

In addition, for social workers the fifocal vision level of the *Framework for Inquiry into the Technological Divide*, assists in placing digital inclusion and exclusion into its socio-political context. This can encompass identifying populations and groups who face multi-faceted social exclusion. This might mean one group has higher unemployment, shorter life-expectancy *and* digital exclusion. Practice responses or interventions at this level might include advocacy and

political and community consciousness raising. In light of dialogues around "developed" and "developing" countries the technological divide has obvious international ramifications.

CONCLUSION

The ongoing presence of a technological divide presents a barrier to the digital inclusion of many members of society. This exclusion limits the ability of people to participate economically, politically, educationally, socially and therefore presents an obstacle to the maximisation of human wellbeing. The *Framework for Inquiry into the Technological Divide* is a social work framework for understanding the technological divide that employs different levels to show that digital exclusion is both socially generated and has social and individual consequences.

The paper has referred to a number of publications which will help readers further understand the components of the framework and their specific role in informing research, policy and practice, as well as citing the research publications which highlight the empirical grounding of the framework. The key message is that closing a technological divide requires research, policy and practice interventions that address 'blocks to power' to each of: access, knowledge, awareness, learning opportunities, support and skills, as all of these play a key role in effective utilisation of ICT. At a local level the dementia and carer research project illustrates one aspect of this ongoing process. At a regional and international level the role of the framework is in structuring and underpinning activities aimed at reducing technological inequality and increasing consistency in the way in which technological inequality is conceptualised and researched.

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