Information Communication Technologies and New Indigenous Mobilities? Insights From Remote Northern Territory Communities

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Abstract

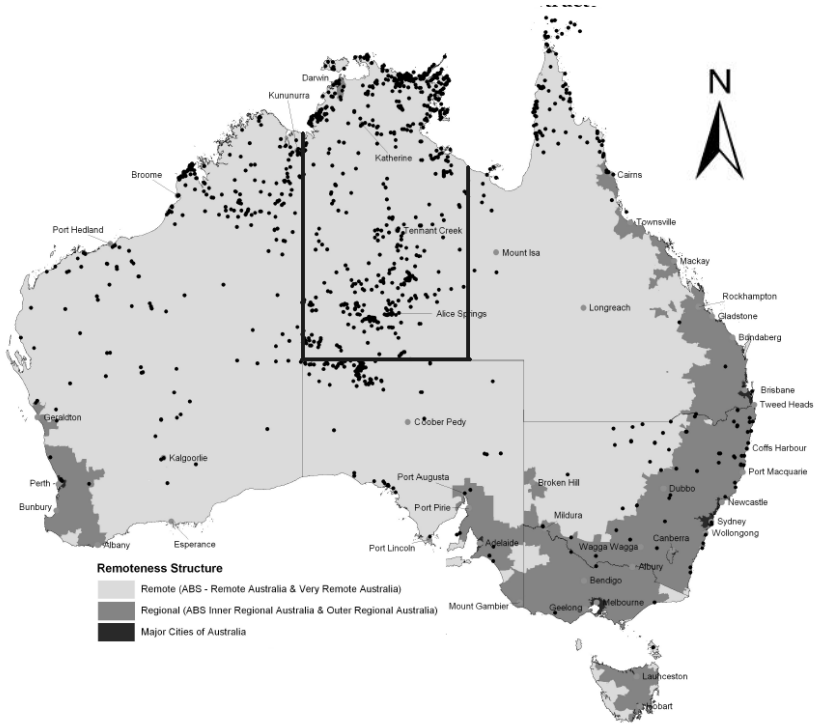
Like most of the jurisdictions highlighted in this edition, the Northern Territory of Australia has a large Indigenous population who live in small communities isolated from major service centres and urban areas. A digital divide has long existed for residents there but with the rollout of the Internet enabled "Next G" mobile phone network from 2006, along with other technology infrastructure upgrades, residents are going through a rapid 'catch up' in personal technology ownership and use. The new network allows for both reliable communications with the outside world as well as broadband access to the Internet. Studies elsewhere highlight potential for these gateways into the global world to bring about changed aspirations and behaviours in relation to life choices for education, employment and where to live, particularly amongst young people. In this study we explore the early outcomes in relation to these themes from the uptake and use of information communication technologies by residents of three remote Indigenous communities in the Northern Territory of Australia. The results suggest that technology, particularly the mobile phone, is already changing people's lives, bringing with it opportunities and possibly negative consequences. The research demonstrates the value of observing and commentating on the process of technology adoption as a lens for re-considering how we might perceive Indigenous disadvantage and its turnaround.

Keywords: Information communication technologies, Indigenous migration, Indigenous communities, Northern Territory, Indigenous demography

1.0 Introduction

The Northern Territory (NT) has a population of around 230,000, of which a third are Indigenous. This is the highest proportion of all States and Territories in Australia. The settlement distribution of the Indigenous population is best described as highly remote and widely dispersed, with around three quarters living in small communities outside of the urban areas and larger service centres (see Figure 1). Residents fare poorly in almost all measures of socio-economic status compared to other Australians. This is despite long-standing efforts and massive investments by governments to address economic, educational and social issues.

Figure 1. Aboriginal Communities in Australia with the Northern Territory Highlighted



Source. Modified by the author from DBCDE (2009).

Residents of Indigenous communities are known to be highly mobile on a day to day basis and to travel frequently between communities, service centres and urban areas. (Prout, 2008; Taylor & Carson, 2008). Despite regular interaction with larger population centres, rates of information communication technology (ICT) ownership and use in (Indigenous) communities have remained well below those found elsewhere in Australia (Australian Communications and Media Authority [ACMA], 2008). In 2002 just 591 residential phone services were active in communities in the NT (ACMA, 2008). By 2006, only 12% of Indigenous households had some form of Internet access compared to 57% of others (ABS, 2010) and as recently as 2007, just 16% of remote Indigenous communities had terrestrial mobile phone coverage (ACMA, 2008). Consequently, Indigenous people have long been seen as symbolic of the 'digital divide' between urban and rural or remote populations (Daly, 2005; Perley & O'Donnell, 2006).

This study aims to provide early indications on whether and how a range of technology developments causing a quantum leap in ICT access at communities have impacted on the lives and aspirations of residents. First is a discussion on the reasons provided in the extant literature for the ongoing digital divide between residents of communities and the rest of Australia. Subsequently the nature of ICT developments specifically affecting communities from the mid-2000s onwards are outlined and results from studies elsewhere in Australia and overseas, where similar leaps in technology have happened, are put forward as examples of what might happen here. The methods for this study are then outlined before presentation of the results, discussion and conclusions. Throughout this paper the word 'communities' should be taken by the reader to mean remote Indigenous communities in the Northern Territory.

A major obstacle to ICT adoption in communities has been the costs to governments of establishing and maintaining reliable mobile phone networks (ACMA, 2008). Consequently infrastructure investments were fragmented over time leading to poor reliability and coverage for services of all types (home phone, public phone boxes, mobile networks and the Internet) in and around communities (Daly, 2005). Prior to 2006, most communities relied on satellite technology for Internet access and mobile phone communications. For the handful of communities who were connected to the CDMA (Code Division Multiple Access) mobile network costs were high and service levels notoriously poor (Tangentyere Council and Central Land Council, 2007). The prohibitive prices of satellite left most community residents with limited options for communicating with the outside world; these being public pay phones (often not working) or the phones and computers owned by service providers, friends or relatives (Dyson & Brady, 2009).

As well costs for governments and consumers, low literacy and numeracy rates and a lack of cultural content were identified as retarding more widespread ICT use in communities. Some commentators have perceived low uptake rates as a natural outcome from the exceedingly poor levels of English literacy and numeracy persisting at most communities (for example, Dugdale, Daly, Papandrea, & Maley, 2005; Dyson, 2004; Dyson & Underwood, 2006). Meanwhile many localised trials of technology-based initiatives were criticised for not consulting with residents and for not including content that was contextualised according to the local culture (for example using the local language) and circumstances (Perley et al., 2006). More complex socio-cultural issues were articulated by Dyson (2004) who summarised cultural 'ethicist's' concerns over the push for catch ups in ICT use in communities as merely a continuation of the march of "cultural imperialism" (p. 58); destined to either fail from rejection or to destroy valuable cultural legacies altogether.

Clearly, therefore, a technology gap of major proportions has long existed between remote Indigenous and other Australian's, continuing well into the Twenty First Century. The numbers around this were so stark that they approximated the contrasts seen between Third World and developed nations at the turn of the last century, sentiments echoed in the pessimistic forecasts of researchers in the field for a potential closing in the divide in Australia (Daly, 2005). But from the mid-2000's a number of developments altered the status quo in relation to ICT access in communities. The most significant was the public-private partnership to rollout Telstra's 'Next G' network to remote communities from 2006 onwards. Next G (a 3G network allowing mobile broadband access) superseded the existing CDMA network across Australia. Its functionality, range, reliability and signal quality are a big improvement and many communities are now 'switched on' (to Next G) with the rollout continuing at the time of writing. Importantly, Next G supports mobile broadband access through Internet enabled phones or other devices (laptops and so on).

Concurrently, Indigenous school children in communities throughout the NT are each receiving a hardy wireless-Internet enabled laptop called the 'XO' at no cost. Provided by the One Child One Laptop (OLCP) philanthropic organisation, the XO is specifically designed to withstand the harsh conditions found there (OLCP, 2010). Other national educational ICT initiatives are underway including the Australian Government's Digital Education Revolution, which aims to "prepare students for further education, training and to live and work in a digital world." (DEWR, 2009). This is supported by the rollout of the National Broadband Network, a major policy commitment from

the encumbrant Australian Government which will see remote communities furnished with upgraded ADSL2 wireless and satellite services with speeds of 12 megabits per second (Conroy, 2009).

Studies in Australia and overseas suggest that this rapidly acquired access to ICT communications might bring about downstream impacts for employment, education and life ambitions for residents in the NT. Brady and Dyson (2009), for example, recorded mobile phone ownership rates of around 60% less than one year from switching on the Next G network at two Indigenous communities in Queensland. Higher rates still (around 80%) were recorded for young people. Similarly a small qualitative study in Central Australia found extremely high rates of mobile phone ownership by young Indigenous people (Tangentyere Council and Central Land Council, 2007). Localised studies have reported on Indigenous people's use of mobile phones for Internet banking (ACMA, 2008; McCallum & Papandrea, 2009) and for shopping (ACMA, 2008). Younger users have been found to frequently access music, sports and game sites; are familiar with Google products and social networking sites like YouTube, Facebook, Bebo and MySpace where they upload films and photos; and are establishing and maintaining social relationships (Kral, 2010). Digital technologies have also been used to record and preserve traditional knowledge (Daly, 2005) including ancestral songs. Meanwhile, online galleries (Corbett, Singleton, & Muir, 2009) and e-commerce (Dyson, 2004) have changed the product distribution system for Indigenous arts and crafts created in communities and now sold worldwide via the Internet.

From a situation of information isolation, the exposure of individuals to the 'globalised world' suggests that new opportunities and challenges will arise. Postman (1992) proposed that technology has the power to fundamentally alter the preferences of individuals in relation to key aspects of their live courses (education, employment, family formation and so on) and influence the way people think and interact as communities. Importantly, examples from overseas hint at the potential for the 'switching on' of ICT to trigger migration flows to larger urban centres. Muto's (2009) study in rural Uganda, for example, found that residents with recent access to mobile phones applied them to job seeking and the negotiation of work contracts without leaving their villages; and then left to commence their work. Paragas (2009) describes the possibility for lives of "spatial simultaneity." (p. 39) provided by mobile phones for transnational migrants, and Hahn and Kibora (2008) discuss ICTs ability to ease the emotional burden of migration by facilitating low cost visual (for example, Skype) and verbal contact between family and friends, making cities more 'sticky' for in-migrants, a proportion of whom might otherwise have returned home.

Key amongst the challenges facing policy makers and service providers to communities in Australia is the extent to which individuals might embark on a journey of technology assisted 'mainstreaming' which, after all, is a clear goal for Indigenous affairs in this nation. Put simply, having observed facets of the modern world, will the current youth take steps to locate to places where they can experience these first hand? The small size of individual communities underlines the importance of understanding the potential migratory impacts because just a handful of young people leaving can endanger the fabric and sustainability of communities. This has certainly been the experience for many Indigenous villages in the remote parts of Greenland, Alaska and Canada (Norris, Cooke, Beavon, Guimond, & Clatworthy, 2004; Rasmussen, 2007) where the encroachment of modernity triggered large rural to urban migration flows from the 1970s onwards.

Consequently baseline knowledge is needed in relation to the NT on the ways in which community residents might, if at all, deterministically enact 'new mobilites' by re-envisaging their world view as a consequence of recent access to ICTs. Extending Cook and Belanger's (2006) proposition that there is much to be learnt from studying the influences and motivations for Indigenous migration, this study provides early indications on whether and how the lives of Indigenous people in remote communities in the NT have been altered by technology uptakes. It explores the interrelations between this and the key life areas of education, employment and future aspirations to identify some of the challenges and opportunities that technology is bringing to residents of some of the most remote parts of Australia.

2.0 Methods

Research for this study was conducted in three medium-sized Indigenous communities (populations of between 300 and 500) in remote parts of the Northern Territory. Indigenous people comprise between 80% and 95% of the population at these communities with the remainder being non-Indigenous workers (teachers, sports facilitators and so on). At the time of the study in 2010, the Next G network was switched on at two of the three communities and scheduled for activation the following year in the other. In-depth interviews were conducted using a semi-structured approach with around 40 to 50 Indigenous participants. This number is non-specific given that some group interviews were conducted with varying levels of participation from individuals such that the total number reflects the researcher's best estimates about active participants. A range of non-Indigenous key informants were also asked for their perspectives on the use and adoption of ICTs in the communities they lived at. These included school principals, teachers, a council manager, a sport and recreation officer and a health clinic manager. People of all incomes and education levels were considered as being in scope.

Indigenous participants were asked what ICTs they currently owned, how often they used these, and for what purposes. Interviews included questions and discussion about the types of content and information people viewed and what purposes these were applied to. Questions on use of Internet-based social media applications were included. Information on the impacts of ICT use on personal mobility and observations on the mobility impacts for family and friends (including for trip planning, information sourcing, use during travel and use after travel) were sought. Themes included how ICTs are influencing decisions about future travel and how travel related information is shared using ICTs. A question was also included about how the use of technology might be shaping the aspirations of the individuals in relation to where they would like to visit, live, work or study in the future and why.

This qualitative approach was preferred to a more structured survey so that individual's 'stories' on the effects of ICT on life aspirations, education and employment could emerge. It was anticipated that complex and rich information would be forthcoming using a discursive approach while indications on the rates of technology use could also be gained by interview, albeit not on a representative scale. The conversational style of gathering information was considered to be more likely to yield meaningful information in the remote Indigenous community context and allowed for group discussions, a key feature of communication in Indigenous settings. Relationships must be established with individual participants for meaningful information to flow and for the intent of the research to be understood by participants such that they engage openly and actively with the researcher (see, for example, Taylor, Bell, Axelsson, & Barnes,

2011). This approach has previously been endorsed by the Human Research Ethics Committee for research at Indigenous communities and specific clearance was also obtained for this study.

The method, along with most qualitative research techniques, comes with limitations. Principally, there is the possibility for the researcher to influence participant responses by the nature or line of questioning employed. The use of open ended questioning helps to minimise these risks; however, it may also introduce topics not directly relevant to the research questions at hand and lengthen the overall discussion. There is also potential for the researcher to articulate or introduce information, concepts or conclusions into the interpretation of results from individual interviews based on personal perception or personal bias. To help increase the robustness of the information gathered, the researcher engaged a local resident to help explain the intent of the research to potential participants and to assist with translation where necessary. The researcher ensured that clarification and confirmation of participant views were obtained during interviews.

3.0 Results

Rates of mobile phone ownership and use were reported to be very high at each of the three communities, including by those who live where there is no mobile phone reception at all. Interviewees estimated that between 60% and 80% of people over ten years of age owned a mobile phone and used it regularly, or had access to one and used it regularly. Rates for young people were said to be even higher than for the general population. It was reported as common for parents to buy a mobile phone for children aged 9 years and up. Young people were observed texting and using their phones almost constantly in the two communities where there was Next G coverage. While it was difficult to establish whether gendered differences in mobile phone ownership and use exist, there were reports that young girls in particular are intense users because they regularly access Internet chat rooms. There were no complaints about the quality of mobile phone access or coverage. People at the community without coverage seemed to accept the delay in the arrival of Next G and many were aware of when it would be active. Only one respondent across all three communities reported having a land line at her house.

Respondents in the community without mobile phone services reported similar rates of ownership to those in the communities where Next G was already operating. However, the nature of use was clearly different since mobile phones were primarily a tool for communication when people were travelling away from the community and in areas with coverage. Several respondents across all three communities discussed the importance of mobile phones for relaying information to extended family members about other family and friends who were away from home. Conveying information, in particular, emphasised the importance of owning a mobile phone in case of emergencies during travel and for ensuring people were contactable en route. While it was not fully explained how information could be relayed back to community members when there was no mobile service, it appears that messages are relayed via friends and family in nearby communities.

Although some elders and key informants thought that technologies like mobile phones and the Internet posed some threats, overall the attitude towards high rates of youth ownership and adoption was found to be positive. One elder expressed his desire for more ceremonial dances and songs to be recorded digitally because the only person remaining alive who knew them lived away from the community. The main problem reported with mobile phone use was

its role in fuelling arguments and fights between residents of two communities because of derogatory text messages regarding the outcomes of Australian Rules football matches.

Substantial variations in the functions commonly used on mobile phones were reported between generations. Older interviewees used phones mainly for making calls, having them nearby in case of emergency and for staying in contact with family and friends. A male participant said: "I only use it for emergency, or to call parents." By contrast, younger residents in all three communities preferred texting to making phone calls, and nearly all said they accessed chat rooms frequently and regularly. The "airG" service, a suite of Internet chat rooms accessible on Telstra's Bigpond plans, were spoken about widely. One of these, "Divas", was reported to be very popular with young girls and said to be accessed daily by most users. Young people said that they use the chat rooms for entertainment and to communicate with people who are known to them (in their home community or other communities in the region) and one young person said he "makes friends all over the world." Although one respondent reported that access to airG was free on a pre-paid Bigpond plan, this was not established definitively. Interestingly, none of the respondents who said they regularly use chat rooms perceived this as Internet use as explained by a young female participant: "We don't go on the Internet, just airG chat."

Some young respondents said they constructed text and chat room messages in their traditional languages for interacting with people of their own language groups. But for communications with non-Indigenous people, English was said to be used and special attention was paid to grammar, spelling and sentence structures. Some reported that young people gathered in groups to help each other construct linguistically appropriately text messages before sending them. Younger residents also used mobile phones for entertainment including playing games, downloading and listening to music. Pictures are often taken using mobile phones and stored on internal memory cards while audio and video data were transmitted to other devices via MMS or Bluetooth. Transmission to computers via USB-connection was reported, but not on a widespread basis.

Several parents and their children present at interviews talked about the importance of mobile phones as status symbols for young people. They said that children always wanted the newest and most upmarket model phone available at the local store. Phones are reported to be frequently lost, borrowed without return, or broken. In all cases people simply purchase another phone and no respondents indicated that this created a financial burden or caused them to suffer financially. Other than those with a mobile phone supplied for work, all respondents who were asked about what type of plan they were on said "pre-paid". Top-ups for pre-paid accounts were available at community stores and at stores on trips away. Pre-paid accounts were said to be ideal for managing how much gets spent on using the phone. The use of mobile phones for e-commerce was not reported to any extent, but a handful of respondents said that they or people they know used their phone to check their Basics Card balance (the Government issued card for managing individual welfare payments) online. Checking balances by calling the 'Freecall' number was a more common approach to managing this aspect of individual finances.

Private ownership of laptops and Internet use in the home was said to be limited in all communities, but there were reports of children using XO laptops at schools and in other settings. While there was not much discussion about young people's Internet use, in one school some teachers outlined their strategy to motivate students to attend school and complete homework by rewarding them with Internet time on school computers after school. In addition, some

respondents were clearly 'power users' of laptops and the Internet. One young lady said she actively searched the Internet for Indigenous committees and advisory groups to join in order to travel interstate regularly. She was also about to commence a university course in Brisbane where she was temporarily relocating, but did not see herself permanently moving away. Some respondents said they used the Internet on computers at work, mainly for emails, and also sent emails on behalf of other community members. One group of older ladies were very keen to learn from the researchers about what hardware and software was needed to setup wireless broadband connections. When advised of the costs (including the cost of purchasing a laptop) they felt these were reasonable and that only a lack of information on how to set it up and to operate it had prevented them from purchasing the equipment and getting online.

At the time of the study a computer course was being conducted at the training centre of the community without a mobile phone network. The course was relatively advanced and included formatting hard disks and installing operating systems. The researchers were permitted to talk to the group (eleven young men). They all had a strong desire to use the Internet to source information to satisfy their curiosity, but said they do not apply structured processes to using the Internet. Instead, as one put it, they largely "go where it takes them." One attendee said he likes to look at information and images on faraway places because he has curious dreams about going there. When asked where he would go if money were no object he replied "Las Vegas!" All of the course attendees were in agreement (when one said) that having the skills to use the Internet and computers would help create new life opportunities, and especially jobs. Some thought those jobs might be elsewhere in Australia or overseas but none indicated they had specific plans in place to pursue a life outside of the community.

Mobile phones were found to be widely used to support travel away from communities. In two out of three of these, at least some Indigenous residents said they searched for information about destinations, activities and attractions on the Internet but overall the use of travel based Internet applications (travel blogs, travel intermediaries and so on) was not reported. In contrast to the pre-travel stage, mobile phones were frequently used by remote Indigenous travellers during trips. They are used to contact relatives at home during the journey or on arrival, to call friends or relatives living elsewhere, and to take and send pictures of travel experiences. Maintaining contact with the home community during a longer stay away and staying reachable en route were the main benefits put forward in relation to mobile phones and travel. While there were no reports of mobile phones being used to organise transport or to book accommodation, non-Indigenous informants reported that Indigenous visitors from remote communities were frequent users of Internet cafés once they were in the service town.

Interviewees across the three communities said they take pictures during journeys and show them around on return. Young interviewees said they stored pictures on their mobile phones for long periods and, once memory cards were full, bought new ones. The transmission of photos to computers or laptops was rare. Only young people reported transmitting them from their phone to a computer for storage purposes, but there were no reports of uploading images to social media sites or other web 2.0 applications (like Facebook). Pictures taken by friends and relatives during travel did not directly, according to interviewees, motivate other community members to travel to the places represented in the scene.

A number of parents spoke about their children who were interstate at boarding schools and some teachers said their school had a 'feeder' partnership with a

specific (private) school interstate. One family said they use Skype every night to communicate with their daughter who lodges interstate at a boarding school. Overall, few expressed a desire to move permanently to such places even if the experience of travel there was good. Older people were less likely to consider living away from their community when asked if they could envisage ever doing so. Nevertheless, it is clear that at any given time, significant numbers of people are interstate, many for extended periods of time. School children, for example, spoke of excursions interstate and many young males have travelled away to play Australian Rules football exhibition matches or to compete in leagues interstate. There were no reports of mobile phones leading directly to employment or being used purposefully to seek and gain employment.

Meanwhile, examples of the potential for ICT to generate touristic activity (visitors) at communities were found. Managers at the arts centre at one community, who were proactive in training staff on ICT use, spoke about their use of ICTs to promote the annual festival and sell tickets online. This had led to large increases in visitor numbers such that new camping grounds were needed. Some younger interviewees were critical about the effects of large crowds being present in the community during the festival. People involved in this discussion were aware of the barriers to success, chiefly the processes and systems required to facilitate visitors to obtain permits to access Aboriginal lands, however, a pass was included with the ticket in this case.

4.0 Discussion

It is clear that ICTs, particularly mobile phones, are now part of everyday life for residents of the three communities in this study. The change from exceedingly low rates of ownership and use to very high rates has occurred within a very short timeframe (one to two years). The current young generation will be the first to use such technologies on a daily basis to communicate, be entertained and to carry out e-commerce, with the next generation likely to be even more 'connected' to the global world. The rapid and widespread uptake of mobile phones, even at places with no reception, echoes research findings in other parts of Australia. Similarly, the main functions and uses to which mobile phones are put are congruent with a handful of studies elsewhere like that of Brady and Dyson's in remote Queensland (2009) and Kral's (2010) study. While computer based Internet and e-commerce activity in NT communities is comparatively low, the use of social media sites and general (unstructured) searching is seemingly quite popular.

This study has brought to light some new information including the everyday access to chat rooms by young people on their mobile phones. Most do not realise (or care) that this is done on the Internet. Such active consumption of Internet based information and exchange is consistent with early user behaviour during the process of technology diffusion. Kral (2010), in his study in remote a Western Australian community observed young people to be:

> "…learning by observation, trial and error experimentation, peer teaching and learning, and everyday practice because the new digital technologies are meaningful and relevant." (p. 14)

This self-directed and snowballing approach to learning via technology is happening largely outside of the direct influence of programs in place for developing and educating young people with mainstream skills in these areas. There are no courses on 'how to use a mobile phone' being run, for example. Instead, with the infrastructure finally in place young people are grasping

technology for its entertainment value, interactivity and to find and share information. Quite simply, they really enjoy using it and this is entirely consistent with studies on the explosion of mobile phone use by poor and marginalised populations in places like Kenya (for example, Wachira, 2003).

The small number of people using the Internet via home computers, in contrast to the general population of Australia, means that the Internet per se is not something that people feel they need to know a great deal about. Instead, individuals are satisfied so long as they have sufficient information, equipment and skills to access the things they want to access at the time, based largely on what other people are doing. Consequently, the educative and employment generating power of the Internet is currently under-utilised, or at least poorly understood. It is likely that mobile phones will make only limited contributions to improving these outcomes in the short-term and there are no indications that people are basing future decisions about where to live or work on information or experiences they have garnered using their mobile phone. There were, however, exceptions found in this study. A small number of frequent Internet users can be found at each community and they are actively applying their ICT skills towards creating opportunities for themselves and others. For some, this has shaped their travel patterns and their spatial mobility but for now it has not yet inspired them to move away from their communities.

The ability for individuals to establish and maintain personal networks and communications when travelling away from communities is a particularly important consideration in discussions about the role of ICT for travel and migration. The mobile phone provides security, information about loved ones, and support in case of emergencies. As we found for the family who Skype every night with their daughter away at boarding school, mobile phones and Internet based applications are helping those who are away to remain there.

The speed at which mobile phones have been adopted in remote NT communities dispels the myth that there is insufficient capital from within (economic, social and individual) for remote Indigenous people to grasp 'mainstream' and globalised concepts and practices. While demand-side constraints have restrained technology uptake in the past, clearly with the mobile phone the market has found a product it can integrate into daily life to achieve individualised outcomes. The apparent lack of concern over pricing and costs affirms that people have the skills and wherewithal to shift funds between competing priorities in order to meet their needs at the time and that incomes are not universally low. ICTs are a desired and desirable asset and increasingly so for children who see them as necessary to life and as a status symbol. While there were no indications that purchases of ICTs were being made at the expense of other staple needs, research in this area would be invaluable.

Access to new social, business and transnational networks via Internet based technologies co-facilitates opportunities for other forms of mobilisation to be harnessed by Indigenous people in the NT. Tarrow (1996) has described the power of technology for stimulating and sustaining collective actions including to fight environmental causes and resisting perceived negative policy changes. Recent events in the Middle East have highlighted the speed and effectiveness of technology in mobilising political causes. Over time technology might shift the centre of influence for Indigenous affairs in the north of Australia from its established ideological base where 'outsiders looking in' propose and re-proposing solutions to the 'problem' of Indigenous disadvantage. Instead, technology might allow resident voices themselves to be harnessed and pave the way for engineering solutions from within. Online forums might also expose the entrenched practice where 'consultations' with Indigenous people

around policy formulation, program delivery and evaluations include only the voices of individuals purported as universally representing the diverse views of residents and the community. These gatekeepers of community thought are paraded as figures of unquestioned authority on what is best for the community, when in fact this can be far from the case. Internet based communications permit those too afraid to speak up against the status quo to do so anonymously and to organise others to do likewise.

There are also potential dangers given that children aged as young as 9 years rapidly being exposed to the online community. Not least, the bulk of Internet content comes laden with western ideologies, including materialism and individualism, in other words, globalisation. Some see this as the death knell for Indigenous cultures in remote Australia. Nevertheless, Indigenous Australian's have long been adopting and adapting Western technologies (witness the gun and the motor vehicle) and this study emphasises the ongoing nature of this process. Aside from the obvious opportunities for preserving elements of culture in digital forms and for sharing these with both countrymen and women and with the rest of the world, this study emphasises past contradictions and understated credit given to Indigenous people in remote Australia for grasping, learning, using and adapting western technologies.

There must also be careful monitoring and education programs to help Individuals avoid some of the pitfalls which come with ready access to Internet content and to interactions in chat rooms. Young people need to be taught to recognise and act appropriately on predatory or inappropriate behaviour and receive advice on the dangers of online gambling, obtaining online loans or committing to purchase goods or services over the Internet. Again, much can be learnt from elsewhere, as is the case for Finland where Autio, Wilska, Kaartinen, and Lähteenmaa (2009) spoke of the major financial difficulties created by young people's access to instant loans online. These were used to buy cigarettes and alcohol, and to party. The speed of technology adoption found in remote Australia in this and other studies points to an immediate need for further research, education and monitoring in these areas.

5.0 Conclusions

This study aimed to provide baseline indications about the extent of ICT ownership and use in remote Indigenous communities in the Northern Territory in the short time since the rollout of the Next G network and coinciding technology developments. The proposal that rapid catch ups might occur in line with studies elsewhere in Australia has been supported. Mobile phone ownership rates are high and young people use them every day to communicate and for entertainment purposes, including accessing Internet chat rooms. Some educational benefits from ICT use have been demonstrated in this study with young people saying they help each other to construct text messages in proper English. However, Internet use is currently limited as are the range of functions and applications used online. There are indications that more widespread and purposeful Internet use may not be far away with people of all ages expressing a desire to use it and at least some in each community already doing so in quite sophisticated ways.

The present situation in relation to the interplay of ICT use, education and employment is complex and very difficult to deconstruct according to cause and effect. For example, no link between the recent widespread adoption of ICTs and employment seeking behaviour was found in this study. Nevertheless, envisioning the potential has been made easier. Educators might consider ramping up efforts to get people online and using the Internet in more structured

and purposeful ways. There is also the opportunity to look at expanding the types and delivery of courses to remote communities available online and to teach the current young generation about the information resources on hand from what Levinson has called the "Library with legs." (2004, p. 115).

Turning to aspirations and their effect on mobility and migration, this study found ICTs are used as tools in support of existing travel patterns but have not yet created new ones. If, for example, we depicted all trips and changes of address made by Indigenous people in communities since the switching on of Next G, and compared these to the two years prior, we would be unlikely to observe major changes in the places people visit and the number of people moving about. But as Ishii's (2006) evaluation of the influence of technology on spatiality highlights, there may also be temporal and contextual impacts yet to come from what is clearly a large scale diffusion of ICTs:

> Consequently, ''mobility'' cannot be defined as purely physical travel. Mobility should be understood in a broader sense to include at least three interrelated dimensions of human interaction; namely, spatial, temporal, and contextual mobility. (p. 347)

The introduction and pervasive adoption of mobile phones has certainly begun to influence the contextual. Mobile phones are de-coupling interpersonal communication from societal and cultural norms handed down through centuries. This must be observed as 'progress' in light of the expressed aims of governments to 'close the gaps' between Indigenous and other Australians, as the example of young people gathering round the phone to ensure the quality of language in a text message might suggest.

The elders we spoke to in this study thought that the benefits from technology, including for digitally recording ceremonies and stories (to preserve them and teach young people) far outweighed the risks. Nevertheless, there will be many who see technology as a threat to languages and other cultural facets. The pace of ICT uptake found in this study dictates that those with such concerns should act very quickly to maximise benefits and minimise potential negative outcomes. Equally, the time is now to act to help young people to maximise the benefits from their clear desire to engage with the modern world and to teach them how to avoid the many dangers lurking in cyberspace.

Finally, it is clear that this study represents only a starting point for research in this area. Without longitudinal information on the continued evolution of ICT use in remote Indigenous communities we stand to lose some of the potential dividends for education and employment. We may also find, without realising it, that communities progressively lose their youth cohort over time from out migration to larger population centres, should modernity have similar impacts to those in developed nations overseas. Major issues for planning, resource allocation and community sustainability will accompany this. On a practical note, the immediate need is to develop strategies to help young people steer around and away from situations online which may cause them financial, emotional or physical hurt.

Finally, the speed of technology adoption in remote communities has been at the fastest speed of all, the speed of the imagination of the people who live there. The innovative, enthusiastic and skilful approach of young people in particular should remind us that 'closing gaps' requires more than the re-engineering of bureaucratic solutions from the 'outside'. Instead, purposeful efforts towards finding other ways to harness the mind's eye and

entrepreneurship of remote Indigenous Australian's should be a priority, in recognition that Indigenous people there are the solution not the problem.

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