Travelling together and sitting alongside:

How might the use of mobile devices enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in remote communities?

Philip Bruce Townsend

B.Ed.; B.Th.(Hons); Adv.Dip.Min.(Missiology); M.Ed.(Leadership and Management)

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SHORTENED FORMS

ABS	Australian Bureau of Statistics
ACIKE	Australian Centre for Indigenous Knowledges and Education
AEW	Anangu Education Workers
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AIEW	Aboriginal and Islander Education Workers
AITEP	Aboriginal and Islander Teacher Education Program
AITSL	Australian Institute for Teaching and School Leadership
AnTEP	Anangu Tertiary Education Program
APY	Anangu Pitjantjatjara Yankunytjatjara
B.Ed.	Bachelor of Education
BCE	Before the Common Era
BIITE	Batchelor Institute of Indigenous Tertiary Education
BYOD	Bring Your Own Device
CDU	Charles Darwin University
CE	Common Era
CRC-REP	Cooperative Research Centre for Remote Economic Participation
FTE	Full-time Equivalent
GOO	Growing Our Own
ICT	Information and Communications Technology
IHAM	Indigenous Household Adoption Model
IQ	Interview Question
ITE	Initial Teacher Education
ITUP	Indigenous Teacher Upgrade Program
JCU	James Cook University
MATSITI	More Aboriginal and Torres Strait Islander Teachers Initiative
MMS	Multimedia Messaging Service
NARIS	National Alliance of Remote Indigenous Schools
NHMRC	National Health and Medical Research Council
NMC	New Media Consortium
ODL	Open and Distance Learning
PhD	Doctor of Philosophy
PNG	Papua New Guinea
PTS	Preparation for Tertiary Success
PYEC	Pitjantjatjara Yankunytjatjara Education Committee
Qld	Queensland
QR	Quick Response
RATEP	Remote Area Teacher Education Program
SA	South Australia
SES	Socio Economic Status
STEM	Science, technology, engineering or mathematics
TAFE	Technical and Further Education
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UNESCO	United Nations Educational, Scientific and Cultural Organization
UniSA	University of South Australia
UTAUT	Unified Theory of Acceptance and Use of Technology
VET	Vocational Education and Training

SUMMARY

Completion rates for community-based initial teacher education (ITE) programs in two states of Australia (South Australia and Queensland) are low. Over the past decade, the national rate for completion of Aboriginal and Torres Strait Islander students in teacher training was 36%, whereas in the two community-based ITE programs it was less than 15%. Literature in the field indicates that use of mobile devices in education can enhance motivation and increase the likelihood students will successfully finish a course. This research was designed to explore the perspectives and practices of participants about the use of mobile devices in their study.

A mixed methods approach was used to obtain data. Qualitative data was obtained at 15 sites from 64 volunteers (55 females and 9 males) who participated in semi-structured face-to-face interviews and focus groups. Quantitative data was obtained through a survey from 16 volunteer participants. An interpretivist phronetic stance was adopted as an ethical decision to recognise the values of both the research participants and the researcher. A constructivist Grounded Theory approach was used to generate a theory of enhancing professional development through the use of mobile devices.

Most of the participants used mobile devices for educational purposes, such as accessing content, handling administration, sharing personal encouragement and collaborating for academic support. The use of mobile devices facilitated their ability, as adults, to be self-directed in their learning with regard to place and time of study. Participants believed that use of mobile devices helped them finish work more quickly. They suggested that aspects of mobile learning fit with elements of cultural philosophies.

The significance of the findings is that they provide evidence on which a Grounded Theory was constructed, which articulated ways the use of mobile devices enhances the professional learning of these pre-service teachers. New knowledge was created through an explanation of the adoption of mobile devices based on congruencies between aspects of mobile learning and elements of cultural philosophies. A novel researcher orientation was presented which emphasised similarities between notions in Aboriginal and ancient Greek cultures about processes of making friends. A researcher with this orientation endeavours to be “one who comes alongside”.

The implications of the research are that if training providers support the use of

mobile learning in community-based ITE programs then it is likely that completion rates will increase. This will mean a larger pool of qualified Aboriginal and Torres Strait Islander graduates becoming registered teachers and being employed in very remote communities or elsewhere.

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed

Philip Bruce Townsend

Date 4 October 2016

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DISCLAIMER

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1 CONSIDERATIONS

1.1 Argument

The purpose of this thesis is to construct a theory of enhancing professional learning through the use of mobile devices for tertiary study by Aboriginal and Torres Strait Islander pre-service teachers in community-based initial teacher education (ITE) programs in very remote communities. The theory is based on investigation of participants' practices and perceptions of educational uses of mobile devices, and it explicates the nexus between mobile learning pedagogies[1] and cultural philosophies.

My argument is that the problem of low completion rates in community-based ITE programs by Aboriginal and Torres Strait Islander people in very remote communities can be addressed through the endorsement and support by training institutions of the use of mobile devices in tertiary study in order to improve access, retention and success of students. Increasing the percentage and numbers of graduates will contribute to ameliorating the below parity level of Aboriginal and Torres Strait Islander teachers and leaders in the schooling workforce. This is likely to have flow on effects of improving schooling outcomes for Aboriginal and Torres Strait Islander pupils, particularly in very remote communities.

This chapter deals with the context of the research, identifies the underlying problem, presents a focus and constructs research questions. It nominates a theoretical perspective for the research, and highlights the importance of ethical issues. This chapter also recognises limitations and delimitations of the research, and posits the significance of the endeavour. It describes my personal motivation for conducting the research, and outlines subsequent chapters and the structure of the thesis, then closes with a short conclusion.

1.2 Scope of the research

The research concerns the use of mobile devices to enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. This is a matter of educational research set within the field of higher

[1] In this thesis 'pedagogy' is used as a generic term for characteristics of learning, whereas 'andragogy' is used with reference to characteristics of learning for adults as distinct from those for children. See section 3.3.1.1

education in Australia. The filtering and delimitation of the research is set out in Figure 1-1.

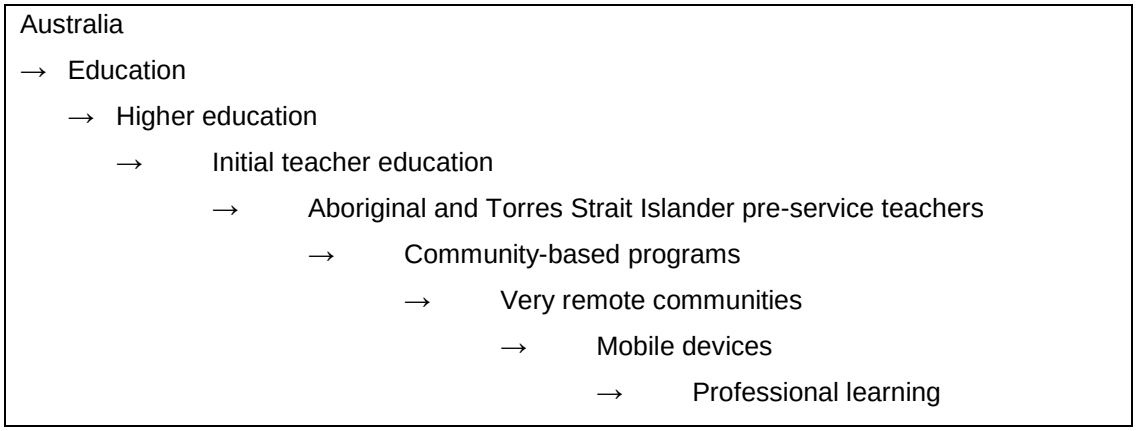

Figure 1-1 The domain location of the research

Data collection for the research occurred during 2013 and 2014. This time frame was chosen to coincide with the conduct of a significant national project under 'The Aboriginal and Torres Strait Islander Education Action Plan 2010-2014' and its National collaborative action plan #33, which was titled 'The More Aboriginal and Torres Strait Islander Teachers Initiative' (MATSITI). MATSITI was set up in 2011 as a four year project aimed at improving the low numbers and retention rates of Aboriginal and Torres Strait Islander teachers in Australian schools. In 2012, MATSITI published its *Report into the retention and graduation of Aboriginal and Torres Strait Islander students enrolled in initial teacher education* (Patton, Hong, Lampert, Burnett, & Anderson, 2012, pp. 27-28), and this research was designed to supplement material there with a particular focus on community-based ITE courses (see further details about MATSITI in section 4.2.4).

1.3 Definitions

Three main components of the research are identified as the participants, the tools they use and their outcomes. Broadly these are respectively pre-service teachers, mobile devices, and professional learning. These are refined to become: Aboriginal and Torres Strait Islander pre-service teachers in very remote communities, use of mobile devices, and progress through an ITE course.

1.3.1 Aboriginal and Torres Strait Islander people and remoteness

Aboriginal and Torres Strait Islander people are the original inhabitants of Australia. The term 'Aboriginal' generally designates First Nations people from mainland Australia and the closest islands, and 'Torres Strait Islander' refers to First Nations

people from the islands near the state of Queensland between the continent of Australia and the northern island of New Guinea (Mooney, 2015). The Australian Government's working definition of an Aboriginal or Torres Strait Islander is a person of Aboriginal or Torres Strait Islander descent, who identifies as being Aboriginal or Torres Strait Islander and is accepted as such by the community in which he or she lives (The Australian Institute of Aboriginal and Torres Strait Islander Studies, 2014). The issue of identity is complex and contentious (Carlson, 2016).

Figures from the 2011 census indicated the Aboriginal and Torres Strait Islander population of Australia was 669,900 people. Around one-third lived in major cities, about one-fifth lived in inner regional areas and also one-fifth in outer regional areas, another eight per cent lived in remote areas and about 14 per cent in very remote areas. In contrast, for non-Indigenous people, 1.2% lived in remote areas and 0.5% lived in very remote areas. Of the total Australian population, Aboriginal and Torres Strait Islander people comprised 16.5% of all people living in remote areas, and 45.8% of all people living in very remote areas (Australian Bureau of Statistics, 2013a). The five mainland remoteness categories just mentioned are based on road distances between locations and five different-sized service centres (Australian Bureau of Statistics, 2013b). Living in remote and very remote communities enhances wellbeing for Aboriginal and Torres Strait Islander people with links to these areas because it reinforces kinship ties, provides opportunities to engage in cultural activities, and people remain on their traditional lands with which they feel a deep affinity (Biddle, 2014, p. 67). The combined area categorised as remote or very remote occupies about 85% of the Australian mainland (Australian Bureau of Statistics, 2011). This is shown in the map (see Figure 1-2) as the light green (remote area) and pale yellow (very remote) areas. Throughout this thesis, the term "remote" will be used in a generic way and include the two remoteness areas of 'remote' and 'very remote' unless otherwise specified. The term "very remote" will refer specifically to the designated remoteness area.

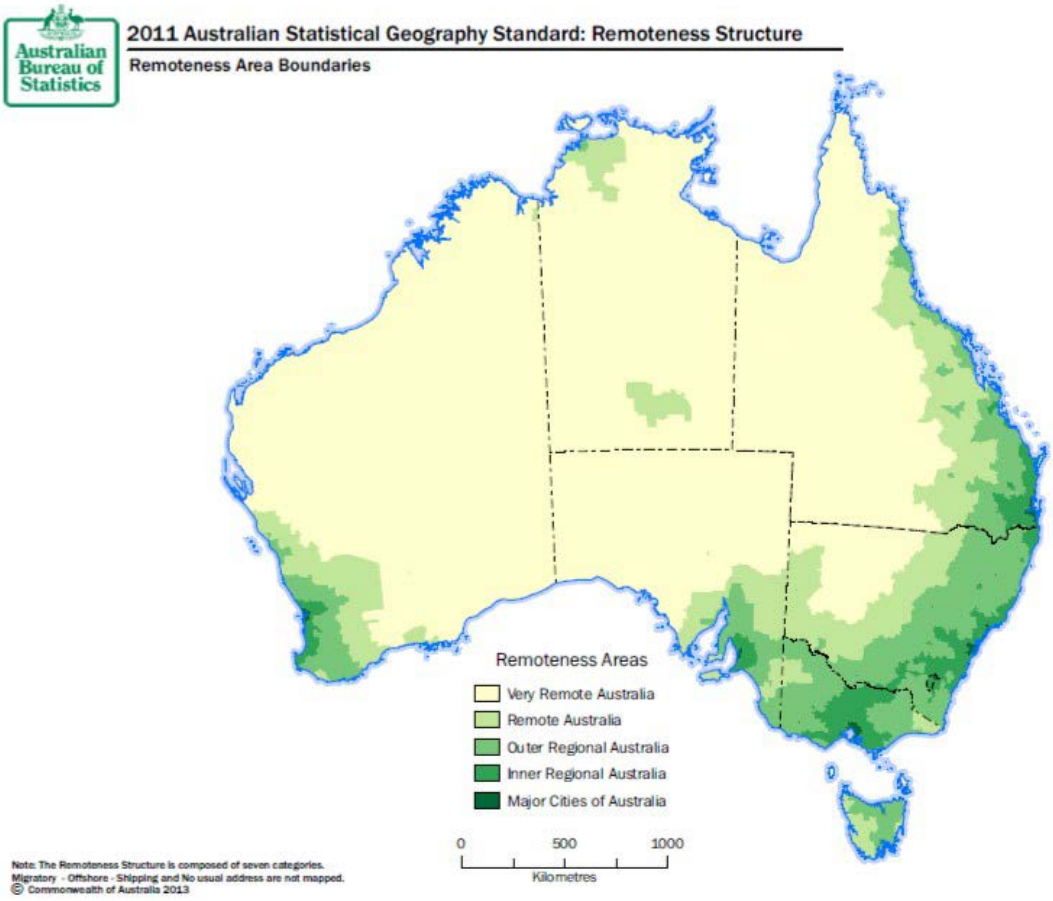

Figure 1-2 Remoteness area boundaries

Source: Australian Bureau of Statistics (2013c, p. 1)

There is no Australian national definition of the term ‘teacher’. For the purpose of this thesis, I define three terms: teacher, pre-service teacher and Aboriginal and Islander Education Worker (AIEW). A ‘teacher’ as a person who has completed an accredited initial teacher education tertiary qualification approved by the state authority and has met any other requirements set by that authority in order to gain full registration, and is thus employable to take full legal responsibility for pupils. A ‘pre-service teacher’ is someone who is enrolled in an initial teacher education program (these may also be referred to as ‘trainee teachers’ or ‘student teachers’). An ‘AIEW’ is an Aboriginal and Torres Strait Islander person employed in a classroom support role in a school – working with pupils, sometimes under the authority of a teacher or sometimes unsupervised and responsible to either a teacher or a principal.

A variety of terms have been and are being used for AIEWs, for example, Aboriginal Teaching Assistants, Aboriginal Assistant Teachers, Aboriginal Teacher Aides, Community Teachers, Aboriginal Education Workers, Indigenous Educators, Koorie Educators, Indigenous Education Workers, Aboriginal and Islander Education Officers, and Aboriginal and Torres Strait Islander Education Workers (MacGill, 2009, p. 13). In many cases, these AIEWs have been the primary source of Aboriginal and Torres Strait Islander pre-service teachers.

1.3.2 Mobile devices

Mobile technologies are herein referred to as mobile devices and are restricted to laptops, tablets and mobile phones. In a report exploring new forms of teaching, learning and assessment it was stated: “Many students now own smartphones, laptops, and tablet computers. They expect to bring these into the classroom, both to support their learning and for personal and social use” (Sharples et al., 2014, p. 17). An Australian study of tertiary students stated, “Laptops, smart phones and tablets devices appear to be dominant technologies being used by students for a range of learning activities” (A. Murphy, Farley, Lane, Hafeez-Baig, & Carter, 2014, p. 343). Similarly, the New Media Consortium (NMC) Horizon Report: 2016 Higher Education Edition, mentioned Bring Your Own Device as an educational technological strategy and said it “is the practice of people bringing their own laptops, tablets, smartphones, or other portable devices with them to learning or work environments” (L. Johnson et al., 2016, p. 36). Sharples is a respected authority in the field of mobile learning and the NMC Horizon Reports are recognised for their impact in predicting trends, challenges and technological developments likely to bring changes to educational contexts. These two authorities and the Australian study support the definition of mobile devices provided above.

1.3.3 Professional learning

How can professional learning be defined, particularly for pre-service teachers? For the purpose of this thesis it is described as what they do as a student teacher, such as in the following quote: “Preservice student teachers’ professional learning is broadly conceived as the interaction between the learner and the student teaching context” (Tang, 2003, p. 484). Opfer and Pedder (2011, p. 376) caution against “simplistic conceptualizations of teacher professional learning that fail to consider how learning is embedded in professional lives and working conditions”. According to M. Cheng, Tang and A. Cheng (2014, p. 154) “Student–teachers’ professional learning can be attributed to three major sources of influence, namely pre-training education experiences, teacher education coursework and fieldwork in the teacher

education programme". Given these perceptions, for this thesis, professional learning is referred to as participation as an undergraduate student in study towards an ITE qualification.

This section identified the three main components of the research, which has a precise focus on specific technologies in one mode of tertiary education with a certain cohort of students living in a particular situation. The following section outlines the context for the research.

1.4 Educational context

National reports on fields such as higher education in Australia (D. Bradley, Noonan, Nugent, & Scales, 2008), teacher training in Australia (Hartsuyker, 2007; Teacher Education Ministerial Advisory Group, 2014) and Aboriginal and Torres Strait Islander peoples' participation in higher education generally (Behrendt, Larkin, Griew, & Kelly, 2012; Kinnane, Wilks, Wilson, Hughes, & Thomas, 2014), and ITE specifically (Patton et al., 2012) are all relevant to establishing the background to this research. A striking feature of each of these reports is the fact that Aboriginal and Torres Strait Islander peoples' access, retention, success and completion rates in higher education are generally below those of the rest of the Australian population. One report analysed completion rates of domestic bachelor students who commenced in 2005 at a publicly funded university and their progression by 2012. Data showed that 45.5% of Aboriginal and Torres Strait Islander students finished their studies by 2012 compared with 72.6% of non-Indigenous students (Department of Education and Training, 2014, p. 9). A similar paper, using the same data and which focused on four equity groups, stressed the compounding effect of membership of multiple 'at risk' groups:

> Overall the main variables indicating higher likelihood of non-completion were part-time enrolment, external enrolment, ATAR below 60, and age over 25. When Australian enrolment data are examined, students within the equity groups of interest here – that is, low SES, Remote, Regional and Indigenous students –are more likely than average to possess the enrolment and demographic characteristics that have been found to be associated with lower completion rates (D. Edwards & McMillan, 2015b, p. 10).

The same authors, in another report, pointed out

> More than one in five Indigenous students in this cohort had dropped out of university before their second year and another quarter had dropped out at some other stage in the nine-year period. The differences between the outcomes of Indigenous and non-Indigenous students are substantial. Analysis of the outcomes of the 2005, 2006, 2007 and 2008 cohorts six years after commencement highlights the consistency of these patterns across cohorts. … Indigenous students are more likely to be older, part-time, regional or remote, and low SES, all variables associated with lower completion rates (D. Edwards & McMillan, 2015a, p. 22).

There are currently 48 providers of ITE in Australia (The Australian Institute for Teaching and School Leadership, 2015, p. 5). In 2016 a submission to a government committee stated "Universities need to improve their game because their attrition rate of undergraduate Indigenous students is very high across all of the schools of education" (*More Aboriginal and Torres Strait Islander Teachers Initiative submission re Educational opportunities for Aboriginal and Torres Strait Islander students*, 2016, p. 3). Data for 2007–2011 for Aboriginal and Torres Strait Islander people studying ITE indicated that 36.3% completed their course (Patton et al., 2012, p. 24). In a similar period (2005–2012) the completion rate for degrees in the field of education across Australia was 73.8% (Department of Education and Training, 2014, pp. 9,11).

Aboriginal and Torres Strait Islander pre-service teachers study on-campus (60.7%) or off-campus (39.3%) (Patton et al., 2012, p. 28). There are several forms of off-campus delivery. These include distance / external delivery through a fully on-line approach; block delivery in which students living away from the campus occasionally attend intensive block courses (some of which may be residential); and reverse block delivery / away from base delivery, in which lecturers run a block course away from the campus. Another method of off-campus mode is community-based delivery, in which a support teacher lives in a community and provides daily assistance at a designated learning centre throughout the academic year. This enables a student to complete a qualification while living in his or her own community and eliminates the need to move to a different town for four or more years. Using this definition, there have been only two ongoing programs that are classed as community-based programs: one in South Australia (Anangu[2] Tertiary Education Program: AnTEP) and one in Queensland (first called Remote Area Teacher Education Program: RATEP, but now officially called RATEP: Community-based Indigenous Teacher Education and commonly referred to as RATEP). Data from Queensland covering the period 2007–2011 indicated a completion rate of

[2] "Anangu" refers to an Aboriginal person who speaks one of the group of Western Desert languages (Anangu, 2011). In this thesis it refers to Pitjantjatjara and Yankunytjatjara people in the north-west of South Australia.

14.7% (Mitchell & Linkson, 2012, p. 26). Completion rates from the program in South Australia are not available to the public; anecdotally they are reported as very low.

The following chart (Figure 1-3) shows the comparison of completion rates for non-Indigenous versus Aboriginal and Torres Strait Islander tertiary students generally, in ITE generally and for the community-based program in Queensland (there are no community-based programs for non-Indigenous students).

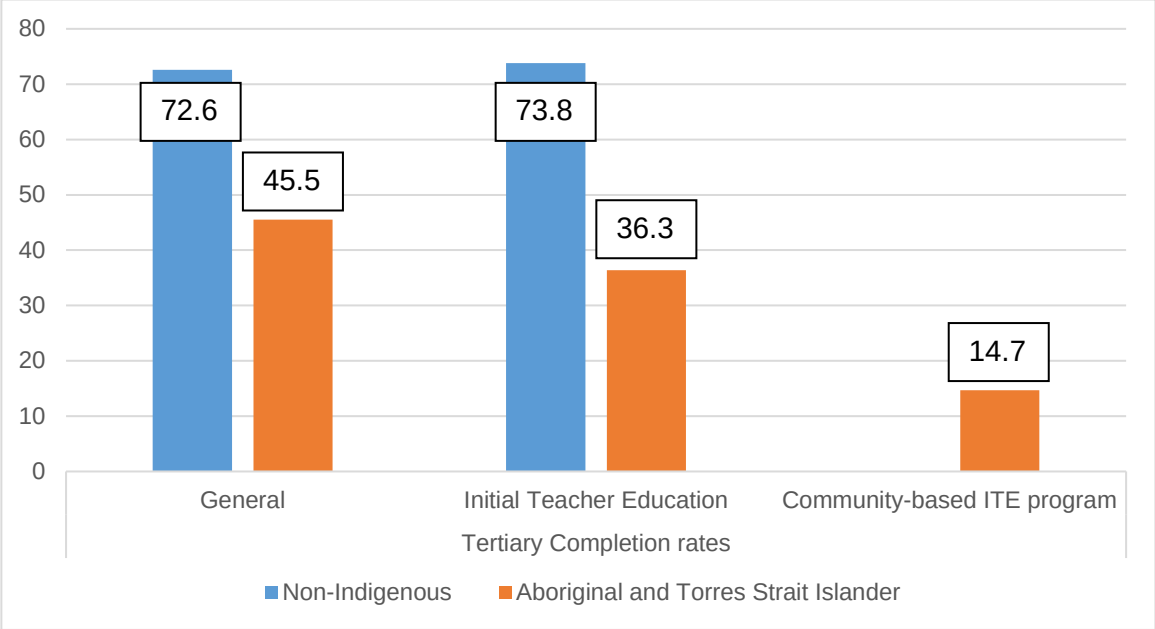

Figure 1-3 Completion rate of Aboriginal and Torres Strait Islander ITE students in one community-based program compared to other students

Sources: Department of Education and Training (2014, p. 6); Mitchell and Linkson (2012, p. 26); Patton et al., (2012, p. 24)

In summary, completion rates for Aboriginal and Torres Strait Islander tertiary students are lower than those of the general population across all disciplines. This is more pronounced for ITE students. Completion rates for Aboriginal and Torres Strait Islander ITE students in community-based programs are less than half the overall rate for Aboriginal and Torres Strait Islander ITE students. This suggests that the matter of low completion rates for community-based ITE programs for Aboriginal and Torres Strait Islander students warrants further attention.

1.5 Problem

The fact of low rates of completion of ITE qualifications by Aboriginal and Torres Strait Islander pre-service teachers in community-based programs in South Australia and Queensland is a problem for Aboriginal and Torres Strait Islander communities

because it restricts the number of local graduates employable as school teachers in remote communities, or elsewhere.

Low completion rates are also a problem for both the Australian Government and higher education providers. They have an economic agenda to supply programs at minimal cost and if a program is inefficient in terms of its completion rates, then that is an appropriate justification to stop offering it. The *Review of Higher Education Access and Outcomes for Aboriginal and Torres Strait Islander People* discussed various funding mechanisms and the need to improve retention and completion rates, and highlighted "the need to maintain outcome-driven accountability by universities and government" (Behrendt et al., 2012, p. 74). If this is interpreted to mean that there is a minimum completion rate which justifies the funding and thereby the existence of a course, then it is likely that community-based ITE programs will be scrapped. The Australian Government and higher education providers are also expected to supply programs for marginalised sectors of the population, including for Aboriginal and Torres Strait Islander people in isolated places. However, if higher education providers no longer offer these community-based courses, then it decreases the likelihood of local people becoming teachers in their own remote communities or in other schools. Thus, both the government and higher education providers face competing economic and social agendas.

Moreover, these low completion rates contribute to below parity levels of Aboriginal and Torres Strait Islander teachers and leaders in the schooling workforce. Less than 1.1% of Australian school teachers and leaders identify as an Aboriginal or Torres Strait Islander person (McKenzie, Weldon, Rowley, Murphy, & McMillan, 2014, p. 28). Australian Census data for 2011 indicates that the estimated resident Aboriginal and Torres Strait Islander population of Australia is 3% of the total Australian population (Australian Bureau of Statistics, 2013a). In 2013, Aboriginal and Torres Strait Islander full-time students accounted for over 5% of all full-time students in Australian schools (Australian Bureau of Statistics, 2014). Whether one looks at the general population of Australia or the number of full time school students, the proportion of Aboriginal and Torres Strait Islander staff is below parity.

The lack of Aboriginal and Torres Strait Islander teachers and leaders may be seen as problems for Aboriginal and Torres Strait Islander children specifically and for the schooling context nationally. As has been stressed by a report into the school workforce: "This discrepancy matters, as Indigenous staff can help adjust teaching methods and curriculum content to be culturally suitable, their presence can make Indigenous students feel less intimidated by the school environment, and they can

provide positive role models" (Productivity Commission, 2012, pp. 260-261).

Local teachers in remote Aboriginal and Torres Strait Islander communities are seen to improve educational outcomes of pupils in two main ways. First, they have deep cultural understandings and are able to support students' learning in what could otherwise be a mainly Westernised mode of formal education, as mentioned by Giles (2010, p. 63): "Indigenous teachers are best placed to bring relevant cultural knowledge, competence and skill to the students' learning in schools in remote indigenous communities". Similarly, a government report stated "increasing the number of Aboriginal and Torres Strait Islander educators is a key factor in fostering student engagement and improving educational outcomes" (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 22).

Second, Aboriginal and Torres Strait Islander teachers in remote communities provide workforce continuity by "potentially reducing the impact of high teacher turnover in school communities" (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 22). Teacher churn has a detrimental effect on children's schooling experiences, as noted by Brasche and Harrington (2012). One author commenting on the context of remote Aboriginal and Torres Strait Islander schools in the Northern Territory described the high turnover of teachers as "so disruptive to the learning of Indigenous students" (Hall, 2012, p. 190). Maher (2013, p. 845) also stated that teacher turnover results in an absence of continuity for pupils "which negatively affects their progress".

Moreover, increasing the number of Aboriginal and Torres Strait Islander teachers may be viewed in the broader educational context relating to the national curriculum and competencies of teachers.

In summary, low completion rates of Aboriginal and Torres Strait Islander pre-service teachers in community-based programs limits employment of teachers in remote communities, decreases the likelihood of the continued offering of such programs, negatively impacts pupils' schooling outcomes, reduces the diversity of the school workforce, diminishes the depth of content in the national curriculum and restricts the breadth of professional skill of the school workforce. It is strategic at a national level then to consider how to address the problem of the low rate of completion of ITE qualifications by Aboriginal and Torres Strait Islander people in remote communities studying through community-based programs. One obvious component to building a comprehensive picture to decide how to improve rates of completion is to interview pre-service teachers involved in such programs for their

perspectives about study. A focus of such interviews is outlined in the following section.

1.6 Focus of the research: mobile device use in ITE

A range of international agencies and organisations (such as the Global System for Mobile Communications Association; the World Bank; the International Telecommunication Union; the United Nations Educational, Scientific and Cultural Organization; and the Commonwealth of Learning) emphasise the broad impact of Information and Communications Technology (ICT) and endorse the potential of mobile technologies for education generally, for remote situations specifically and for ITE and continuing professional development of teachers (Bokova, 2013; Godfrey, Vos, Phillips, & Giusti, 2014; World Bank, 2012). A survey of the use of Open and Distance Learning (ODL) in teacher training pointed to the "appropriateness and necessity of teacher education through ODL" (Danaher & Umar, 2010, p. 175). The following quote affirms the use of mobile devices in teacher training: "Mobile phones, especially larger-screen smartphones … provide a cost-effective avenue for supporting the professional development and pre-service training of teachers, mainly by facilitating mentoring and participation in professional communities" (West, 2012, p. 12).

In Australia, it is anticipated that higher education providers will increasingly utilise mobile devices and social media for teaching and learning (L. Johnson et al., 2013, pp. 7-8). Current trends driving changes in global higher education include the growing ubiquity of social media, and the integration of online, hybrid, and collaborative learning (L. Johnson, Adams Becker, Estrada, & Freeman, 2014, pp. 8-11) as well as the increasing use of blended learning designs (L. Johnson et al., 2016, pp. 18-19; L. Johnson, Adams Becker, Estrada, & Freeman, 2015, pp. 16-17). So too, an important development in educational technology for higher education is the BYOD movement – when people bring their own laptops, tablets and mobile phones to their study situation (L. Johnson et al., 2015, pp. 36-37).

> The BYOD movement is enabling students to learn using the technology with which they are already familiar and comfortable, providing them with a greater sense of ownership over their learning. … today's students expect to be able to use whatever devices they choose to access learning content, take notes, gather data, and communicate frequently with their peers and instructors. In this sense, the adoption of BYOD does not revolve around promoting technology use, but facilitating ubiquitous learning and productivity gains (L. Johnson et al., 2016, p. 36).

Hence, international trends suggest research about the use of mobile devices for tertiary study is relevant to Aboriginal and Torres Strait Islander pre-service teachers

in community-based ITE programs. What evidence is there of Aboriginal and Torres Strait Islander people being interested in using mobile devices?

1.7 Aboriginal and Torres Strait Islander people's use of mobile devices

In the last decade there has been a rapid and extensive adoption of mobile devices, including laptops and tablets and especially mobile phones, in remote Aboriginal and Torres Strait Islander communities. In 2015 it was reported that "For many remote communities, mobile technologies are the preferred mode of communication" (Regional Telecommunications Independent Review Committee, 2015, p. 26). The same document cited a submission from the Northern Territory Government which stated "Smart phones and tablet devices are the product of choice in remote and particularly Indigenous communities. … Most [I]ndigenous communities have bypassed the personal computer and laptop in favour of smartphones and tablets" (Regional Telecommunications Independent Review Committee, 2015, p. 26).

Australia-wide, 70% of Aboriginal and Torres Strait Islander people own a smartphone, and in remote communities 43% of Aboriginal and Torres Strait Islander people own a smart phone (McNair Ingenuity Research, 2014).

The primary purpose for getting a mobile phone is for person-to-person communication with family, kin and friends. Six other key uses are (1) entertainment, (2) creating multimedia products, (3) using other internet services, (4) emergency use, (5) work and (6) study (Auld, Snyder, & Henderson, 2012; Australian Communication and Media Authority, 2008; Brady & Dyson, 2009; Brady, Dyson, & Asela, 2008; Dyson & Brady, 2009; Kral, 2010, 2012, 2014; Kral & Schwab, 2012; A. Taylor, 2012a, 2012b).

People in these communities are using the variety of affordances of mobile devices whether or not there is mobile coverage or internet access (Brady et al., 2008; Broadband for the Bush Alliance, 2013; Featherstone, 2011; Mobile Black Spot Programme, nd; Regional Telecommunications Independent Review Committee, 2012, 2015). Kral pointed out "communication via mobile phones and social networking has rapidly become the norm for Indigenous youth" (2014, p. 171). Similarly the foreword of a collection of essays entitled 'Indigenous Digital Excellence' stated: "Indigenous people have really embraced digital technology, in particular in remote communities" (Huggins, 2014, p. viii). So too, Ganley (2014) commented that "mobile-based technology appears to be where the future is for remote Indigenous communities: community wifi, smartphones and tablets" (p. 15).

The problem that exists is the low completion rate of Aboriginal and Torres Strait Islander people in community-based ITE programs. One strategy to build a nuanced understanding of how to improve completion rates is to ask course participants for their views. Awareness of two factors suggests a focus for interviews. The first is that international trends in tertiary education support the use of mobile devices in ITE. The second is that mobile devices are popular with Aboriginal and Torres Strait Islander people in remote communities. Together these suggest that interview questions should focus on the practices and perceptions of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities about the use of mobile devices in tertiary study. The aim is to discover whether the participants think the use of mobile devices in this context could improve their professional learning and so enhance completion rates in community-based ITE programs.

1.8 Research questions

The following questions guided the research:

1. What elements of content material, administrative support, and personal encouragement for their ITE training do Aboriginal and Torres Strait Islander people in very remote communities use or want to see provided by mobile technologies?

2. In what ways are andragogical methods affected by the use of mobile technologies in the delivery of ITE to Aboriginal and Torres Strait Islander people in very remote communities?

3. In what ways do Aboriginal and Torres Strait Islander people in very remote communities think the use of mobile technologies could affect their rate of progress towards completion of an ITE qualification?

4. How do features of mobile learning align with Aboriginal and Torres Strait Islander cosmology, ontology, epistemology and axiology?

What philosophical and theoretical approach is suited to such an endeavour?

1.9 Theoretical perspective

A researcher must select a theoretical background relevant to the research problem. This will include reference to assumptions about the natures of reality (ontology), knowledge (epistemology), and values (axiology) (Crotty, 1998; Guba & Lincoln, 2005; Silverman, 2010). Six perspectives will be briefly surveyed to determine how

appropriate they are for the examination of the problem and the research focus.

The positivist paradigm – despite new conceptualisations – (St Pierre, Jackson, & Mazzei, 2016) is not appropriate, as the proposed research does not deal with objective reality that can be expressed in terms of variables. Positivist studies commonly employ methods to collect quantitative data, whereas the focus of this research calls for an emphasis on qualitative data and the use of research methods appropriate to interviews with Aboriginal and Torres Strait Islander people.

Interpretivists suggest that reality is socially constructed. Knowledge is subjective and culture-bound. All inquiry is value-laden. The purpose of research is to understand human experience. Interpretivist designs are generally qualitative (Basden, 2011; Goldkuhl, 2012). This paradigm fits with the focus, as the researcher will seek to interpret data arising from interviews.

The transformative paradigm proposes that reality is socially formed. The key issue is empowerment of people. Researchers generally consider their research as a moral and political activity that includes advocacy (Christians, 2005). This paradigm applies to the problem, as some data might highlight issues of social justice.

One aspect of Critical Race Theory explores whiteness and ways in which research methodology can contribute to perpetuating notions of white supremacy through failure to problematise issues of power and representation (Chadderton, 2012; Moreton-Robinson, 2009; L. T. Smith, 2012). This approach could apply to my research as I am not an Aboriginal or Torres Strait Islander person. I am required to reflexively consider my own taken-for-granted assumptions, as I am involved in a racialised and contested area.

Feminist theories consider the role of women and issues of patriarchal power (Grebowicz & Merrick, 2013). These include the notion of standpoint (Harding, 2009; Navarro, 2016) There remain tensions between white middle-class feminists and feminists from other groups about the universality and partiality of feminist concerns (Maddison & Partridge, 2014). In the Australian context Aboriginal and Torres Strait Islander women express their views about the impact of colonialism, dispossession, the continuing oppressions of the dominant patriarchal white society and the resistance and re-empowering of Aboriginal and Torres Strait Islander women (Fredericks, 2010; Huggins, 1998; Moreton-Robinson, 2013). These approaches could apply to this research as the majority of the participants were female, and because these perspectives recognise problems of institutional power. They also call me to interrogate my assumptions as a male.

Post-colonial Indigenous research paradigms recognise the historic context of colonialism and the values and knowledges of Indigenous people (L. T. Smith, 2012). Chilisa (2012) presents a post-colonial relational Indigenous research paradigm from the perspective of a woman from Botswana. She emphasises humans' relatedness to the cosmos within a framework of spirituality. Knowledge is socially constructed. Research must demonstrate accountable responsibility, respectful representation, reciprocal appropriation and be mindful of cultural rights. In Australia, Aboriginal and Torres Strait Islander writers present their views at what Nakata terms the "cultural interface" – the contested meeting place of colonial and Aboriginal and Torres Strait Islander knowledge systems (Nakata, 2003; Nakata, 2007). Post-colonial Indigenous research paradigms, Indigenous knowledges and methodologies could apply to my research as the participants are Indigenous.

Having given a précis of several positions, I selected one approach based on its fit with the following anticipated research realities. Data from this research is likely to express socially constructed realities. Participants will probably indicate that knowledge is determined relationally. The values of both the researcher and the participants are important to the research. Aspects of critical whiteness studies, feminist perspectives and post-colonial relational Indigenous research paradigms apply to the research context.

In particular, I engage with two Aboriginal academics – Karen Martin[3] (2008) and Veronica Arbon (2008) – as I seek to articulate both my approach to the research and explore the role of cultural philosophies in making sense of the data. To that latter end, I suggest that an interpretivist stance is the most appropriate perspective to adopt for this research and I will develop a phronetic constructivist Grounded Theory. Section 3.1 explains this choice in more detail. A number of features of the research were briefly mentioned above, and these point to the imperative to conduct the research ethically. Several elements relating to ethics are signposted in the following section.

1.10 Ethics

Two organisations have established guidelines for research with Aboriginal and Torres Strait Islander peoples. The guidelines of the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) detail 14 principles under six categories: "rights, respect and recognition; negotiation, consultation, agreement and mutual understanding; participation, collaboration and partnership; benefits,

[3] Also known as Booran Mirraboopah

outcomes and giving back; managing research: use, storage and access; and reporting and compliance" (Studies, 2012, p. 3). The document of the National Health and Medical Research Council (NHMRC) specific to Aboriginal and Torres Strait Islander people identifies six core values: "Spirit and Integrity, Reciprocity, Respect, Equality, Survival and Protection, Responsibility" (National Health and Medical Research Council, 2003, p. 8). Furthermore, the latter group also points out that when a researcher applies to a human research ethics committee, the process

> … must have included assessment by or advice from: people who have networks with Aboriginal and Torres Strait Islander Peoples and/or knowledge of research with Aboriginal and Torres Strait Islander Peoples; and people familiar with the culture and practices of the Aboriginal and Torres Strait Islander people with whom participation in the research will be discussed (National Health and Medical Research Council, 2015, p. 35).

This PhD research had to be vetted by my university's Indigenous Education Unit, Yunggorendi First Nations Centre for Higher Education and Research, before receiving approval from the Flinders University's Social and Behavioural Research Ethics Committee. Ethical issues will be discussed further in Chapter 5 when considering aspects of Methodology.

1.11 Limitations and delimitations

At the beginning of research, it is wise to anticipate factors that might impact on the conduct of the study, over which I have no control, that is, limitations. So too, it is appropriate to set boundaries around the research and identify what it will not attempt to do, that is, delimitations.

1.11.1 Limitations

The limitations for this study include, but are not limited to:

- my health, or the health of my family members which might affect my ability to conduct the research
- the health of participants, which may prevent their involvement
- weather conditions, which could affect travel in remote areas
- national infrastructure developments in mobile network coverage, satellite services and roll out of the National Broadband Network
- release of new models of mobile devices and costs of services

- religious and cultural activities in remote areas which could affect my travel and / or participants' involvement
- limited funding to conduct the research
- higher education providers' commitment to facilitating the study with their trainees.

1.11.2 Delimitations

This thesis will not:

- replicate existing studies in the general field of higher education nor ITE nor distance education
- provide a history of education or schooling in very remote Australia
- investigate all types of very remote communities (e.g. pastoral or mining communities)
- explore perceptions about mobile learning espoused by higher education providers.

1.12 Significance

This research is important, as it enables Aboriginal and Torres Strait Islander pre-service teachers to describe their perceptions and practices about educational uses of mobile devices in community-based ITE programs. It highlights the andragogical affordances of using mobile devices in very remote communities, as indicated by the pre-service teachers themselves. Moreover, it reveals ways the use of mobile devices affects the speed at which the pre-service teachers finish their work. In addition, the research generates new knowledge about the alignment of Aboriginal and Torres Strait Islander philosophical perspectives and features of mobile learning.

A key outcome of the research could be endorsement of the use of mobile devices by higher education providers that offer ITE for Aboriginal and Torres Strait Islander pre-service teachers in remote communities. Such institutions could promote andragogical strategies for the use of mobile devices in these courses. Over coming years, Aboriginal and Torres Strait Islander pre-service teachers could develop skills to use mobile devices for professional study. This could enable them to continue engagement with study, despite travelling away from their home community and

school site, and assist them to persevere with study rather than having extensive delays or withdrawing. Mobile device usage may mean students are inspired by colleagues through networking, and they become role models in their communities for the use of mobile technologies for educational purposes. Use of mobile devices may increase the speed of completion of qualifications.

Recommendations arising from this research may lead to increased numbers of registered Aboriginal and Torres Strait Islander teachers. Ideas presented here may contribute to national discussions on changes in the design of ITE qualifications, teacher registration, and professional standards for teachers. There could be impacts on policy regarding funding and infrastructure in the communications industry, regarding the roll-out of the National Broadband Network, mobile coverage and satellite services.

1.13 Personal involvement

This research focuses on Aboriginal and Torres Strait Islander pre-service teachers in very remote communities and their views and practices about use of mobile devices in their study. This topic is of personal relevance to me, and life experiences have contributed to my interest and expertise in this field. Due to my family background and religious faith, my childhood and teenage years included many occasions to meet people from non-Western cultures, including having these people as guests in our home. My father's work provided opportunities for international travel and cooperation with people from several non-Western cultures. Family friends were long-term workers in cross-cultural settings, both in Australia and overseas. These formative experiences laid a foundation of beliefs, attitudes and behaviours regarding my relationships with people from cultures different to my own.

Prior to commencing the PhD, I had 27 years of extensive cross-cultural experience in remote contexts. During study towards a Bachelor of Education I took a specialist cross-cultural stream of subjects. This included my major professional experience practicum in a bilingual school in the Anangu Pitjantjatjara Yankunytjatjara Lands (APY Lands) of South Australia in 1983. Following this, I was a teacher for three years (including two terms as Acting Principal) at a three-teacher school in a small community on the APY Lands. These schools employed Anangu Education Workers (AEWs) in classrooms to work alongside non-Indigenous teachers. These years enabled me to live as a guest of, and work alongside Anangu and begin to learn the Pitjantjatjara language and aspects of their culture. During my time on the APY Lands, the community-based program for ITE commenced, and this was a topic of

conversation with AEWs and teachers in schools.

After time in the APY Lands I spent most of the next 23 years in Papua New Guinea (PNG) (1987–2009) with a Christian organisation. Initially, I taught in a remote rural high school for a year as one of only three non-PNG teachers. The major church denomination in the area was run by local people, and I was placed under their leadership. I began to learn the vernacular, Gogodala. For the rest of my years in PNG I worked with that church denomination in bilingual adult religious education at an isolated location. Alongside teaching responsibilities, I assisted the staff with professional development and mentored visiting teachers from other institutions (as well as being Acting Principal over several years). I also taught for one semester at a tertiary level training institution.

In 2007, a new mobile carrier began operating in PNG. There was a massive, spontaneous uptake of mobile phones, which impacted on many facets of people's lives (Watson, 2011). This sudden adoption of new technology and the obvious ramifications across social, business and educational sectors intrigued me.

On return to Australia I worked for six months with Remote and Indigenous Ministry Support in Bible Society Australia during 2010–2011. My line manager was a friend who had previously been a school teacher in the APY Lands and had been involved in Pitjantjatjara translation since the late 1970s. At a global level, Bible Society staff, including Indigenous workers, use mobile devices extensively in their translation activities and create new digital products for use on mobile devices by Indigenous people. This was also the case in the Australian Aboriginal and Torres Strait Islander context. It showed me the range of work with and educational uses of mobile devices.

Thus in considering a PhD research project, I have been able to integrate my extensive cross-cultural and bilingual educational experiences in assisting the professional development of Indigenous teacher colleagues with their embrace of mobile devices.

1.14 Outline of the chapters

There are eight chapters. This first chapter outlined the context, defined the problem, proposed research questions, identified a perspective for the research, pointed to its significance and noted personal experience leading to the research.

The second chapter provides background about community-based ITE for Aboriginal and Torres Strait Islander people in Australia. It begins with an overview of the

remote context in which community-based ITE programs are located. Details about two such programs in different jurisdictions are provided.

The third chapter presents an overview of theories of adult learning, including professional learning, adoption of technologies, and mobile learning, as well as surveying Aboriginal and Torres Strait Islander cultural philosophies.

The fourth chapter reviews literature and notes the gap for the intersection of ITE, mobile learning and Aboriginal and Torres Strait Islander tertiary students. There is a dearth of material that applies the adoption of mobile technologies and features of mobile learning to the cultural philosophies of Aboriginal and Torres Strait Islander people, particularly for Aboriginal and Torres Strait Islander pre-service teachers living in remote communities.

The fifth chapter introduces the methodology of the research, which is considered in the light of contemporary post-colonial Indigenist research frameworks. A mixed methods approach is outlined which includes face-to-face semi-structured interviews and focus groups and an online survey. The use of audio recordings and analysis of transcripts is described within a constructivist Grounded Theory design.

The sixth chapter presents the findings of the research with regard to the four research questions. Under each of these, information about major findings are presented according to cohorts of participants (i.e. very remote ITE students, ITE students from Other sites and AEWs) and characteristics of participants (i.e. presence of mobile network service, gender and age). Also under each research question emergent themes are identified, quotes from participants are presented and an overview is provided.

The seventh chapter discusses the findings and presents a theory of enhancing professional learning through the use of mobile devices. It includes a section identifying a catalyst for the uptake of mobile devices by Aboriginal and Torres Strait Islander people. The catalyst is seen as congruencies between elements of mobile learning and aspects of cultural philosophies. A new orientation for researchers is presented that addresses relationships between the researcher and the researched.

The eighth and final chapter outlines the original knowledge and contribution to the field, proposes recommendations and makes suggestions for further research. A personal statement of reflections about the research precedes a short conclusion.

1.15 Conclusion

This chapter has presented the scope of the research and the rationale for it. The research questions point to the imperative to understand the perspective of the pre-service teachers with regard to the impact of technology on delivery and participation in tertiary study through community-based ITE programs. The significance of the thesis is that it privileges the voice of the participants, and thereby provides an evidence base for decisions regarding policy by the ITE provider institutions. Moreover, there are potential outcomes that go beyond the immediate concerns of community-based ITE programs for Aboriginal and Torres Strait Islander pre-service teachers in remote locations. There could be contributions to national discussions about entrance to ITE courses, the accreditation of same, criteria for teacher registration, and professional standards for teachers; so too the needs and opportunities for community-based ITE programs in these remote locations may affect decisions regarding infrastructure and services.

The following chapter presents an overview of the remote context in which community-based ITE programs are located, then describes the history of the community-based ITE programs in South Australia and Queensland.

2 COMMUNITY-BASED INITIAL TEACHER EDUCATION

The purpose of this chapter is to provide background about the context of the participants in the research. It explores the impact of low completion rates from community-based ITE programs on parity in the schooling workforce and the ramifications of this for pupil outcomes. It also examines recent documents pertaining to the provision of ITE for Aboriginal and Torres Strait Islander people. It then looks specifically at two ITE programs originally intended for Aboriginal and Torres Strait Islander people living in very remote communities. The chapter has three parts followed by a conclusion: (1) schooling workforce parity, (2) Anangu Tertiary Education Program (AnTEP), and (3) Remote Area Teacher Education Program (RATEP).

2.1 Schooling workforce parity

Chapter 1 identified a problem which serves as a catalyst for the research: low completion rates for Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs. This first section posits these low completion rates as contributing to below parity levels of Aboriginal and Torres Strait Islander people in the schooling workforce.

2.1.1 National staffing data

The level of Aboriginal and Torres Strait Islander teachers and leaders in the schooling workforce is below parity. This holds whether considering Australian population figures or statistics for full-time school students. Australian Census data for 2011 indicates the estimated resident Aboriginal and Torres Strait Islander population of Australia is 3% of the total Australian population (Australian Bureau of Statistics, 2013a). In 2013, Aboriginal and Torres Strait Islander full-time students accounted for over 5% of all full-time students in Australian schools (Australian Bureau of Statistics, 2014). However, data for teachers and leaders in Australian schools in 2013 revealed much lower proportions of staff who identified as being of Aboriginal and / or Torres Strait Islander origin (see Table 2-1).

Table 2-1 Proportions of Aboriginal and Torres Strait Islander staff nationally by school level

Aboriginal and Torres Strait Islander staff	National schools by level	
	Primary	Secondary
Teachers	1.1%	0.8%
Leaders	1.1%	0.2%

Source: McKenzie et al. (2014, p. 28)

2.1.2 Staffing data for Aboriginal and Torres Strait Islander focus schools

The matter of the proportion of Aboriginal and Torres Strait Islander staff becomes highly visible when Aboriginal and Torres Strait Islander pupil enrolments increase. This section examines data about a subset of 940 schools from across Australia identified as Aboriginal and Torres Strait Islander focus schools (ACIL Allen Consulting, 2014a, p. 28). These were defined as "those schools with Aboriginal and Torres Strait Islander students with the greatest need and where effort should be focused to make the greatest difference" (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 44). Schools with high Aboriginal and Torres Strait Islander enrolments were selected until 75% of Aboriginal and Torres Strait Islander enrolments in each state or territory were included; other schools were added where 25% or more of Aboriginal and Torres Strait Islander students were below the minimum national standard in any one of the National Assessment Program – Literacy and Numeracy (NAPLAN) reading, writing and numeracy domains; and individual other schools were added or excluded due to specific characteristics (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 44).

The *Staff in Australia's Schools 2013* survey was commissioned by the Australian Government Department of Education to build on data from earlier similar surveys and to supplement material in the initial National Teaching Workforce Dataset (NTWD) (McKenzie et al., 2014, p. 1). In the survey, 69 primary schools and 37 secondary schools which were focus schools provided responses and the report weighted data to provide national estimates (see Table 2-2).

Table 2-2 Proportions of Aboriginal and Torres Strait Islander staff in Aboriginal and Torres Strait Islander focus schools by school level

Aboriginal and Torres Strait Islander staff	Focus schools by level	
	Primary	Secondary
Teachers	3.6%	2.4%
Leaders	0.0%	2.7%

Source: McKenzie et al. (2014, p. 179)

For the focus schools that responded to the survey, the percentage of Aboriginal and Torres Strait Islander teachers was higher than the national data presented in the previous section. The number of Aboriginal and Torres Strait Islander primary teachers just passed parity when compared to the national Aboriginal and Torres Strait Islander population data, but was still below parity when compared to the level of Aboriginal and Torres Strait Islander children in schools Australia-wide. All other data for focus schools fell below parity at either level of comparison. Many of these schools are in very remote areas, in the same communities as pre-service teachers enrolled in community-based ITE programs. The sites of low completion rates are the same sites where the need for more Aboriginal and Torres Strait Islander teachers is greatest.

2.1.3 Staffing data from the National Teacher Workforce Dataset

The More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI) examined the National Teaching Workforce Dataset, in order to provide "an authoritative benchmark to measure the effectiveness of future workforce reforms" (MATSITI, 2014a, p. 5). Table 2-3 shows the percentage of the total workforce that Aboriginal and Torres Strait Islander people comprise for both principals and teachers in remote and very remote areas

Table 2-3 Proportions of Aboriginal and Torres Strait Islander staff by remoteness area

Aboriginal and Torres Strait Islander staff	National schools by remoteness area	
	Remote	Very remote
Teachers	3.9%	6.6%
Principals	3.1%	7.3%

Source: MATSITI (2014a, pp. 19-20)

The proportion of Aboriginal and Torres Strait Islander staff in these areas is higher than the national figures (Table 2-3 cf. Table 2-1) exceeding parity with the percentage of the Australian population identifying as Aboriginal and Torres Strait Islander. In very remote areas it exceeds parity with the percentage of the Australian school population identifying as Aboriginal and Torres Strait Islander. The figures here are also better

than for focus schools (see Table 2-2). Nevertheless, what is the comparison between proportions of Aboriginal and Torres Strait Islander staff and pupils in these two areas? Data is difficult to obtain to answer the question directly. The following section presents allied information that illuminates the situation.

2.1.4 Staffing data for National Alliance of Remote Indigenous Schools

The National Alliance of Remote Indigenous Schools (NARIS) was formed in 2010 and grew to become a network of over 170 schools that was "focused on working together to create a high quality, committed and sustainable remote education workforce" (What Works - The Work Program, 2012, p. a). These schools were in remote and very remote areas and the overwhelming majority of enrolled pupils were Aboriginal and Torres Strait Islander children. The alliance has ceased to operate; however, the list of schools is an appropriate base for collating data about remote and very remote areas. Given the participants in this research were from community-based ITE programs in Queensland and South Australia, information about NARIS schools in those states is presented. Data for NARIS schools in Queensland for 2015 showed an average Aboriginal and Torres Strait Islander enrolment of 83.7% (for those NARIS schools with enrolments greater than 75%, the average was 97.8%) For the NARIS schools in South Australia in 2015, the average Aboriginal and Torres Strait Islander enrolment was 94.3% (My School, 2016).

Across all NARIS schools in Queensland for 2015, Aboriginal and Torres Strait Islander full time equivalent teachers or leaders comprised 15.6% of the schooling workforce (Department of Education and Training, 2015). This exceeds national parity figures, but is still much less than the percentage of Aboriginal and Torres Strait Islander children in those schools, that is, 97.8%. For NARIS schools in South Australia in 2015, no official figures were available from the state department of education. However, examination of the 'My School' website (Australian Curriculum Assessment and Reporting Authority) and school websites along with observation during my field trips in 2013 and 2014 leads me to suggest that for South Australian NARIS schools in 2015 Aboriginal and Torres Strait Islander full time equivalent teachers or leaders comprised 2.3% of the schooling workforce. This too, is much less than the percentage of Aboriginal and Torres Strait Islander children in those schools, that is, 94.3%. For NARIS schools there is a marked difference between the two states with regard to Aboriginal and Torres Strait Islander full time equivalent teachers or leaders, with Queensland having a higher percentage than South Australia. However, in both states this percentage is much lower than the percentage of Aboriginal and Torres Strait Islander children enrolled in schools. This data for NARIS schools in Queensland and South Australia for 2015 compares with

a national figure of 10% of Aboriginal and Torres Strait Islander teachers who work in remote and very remote areas (P. Johnson, Cherednichenko, & Rose, 2016, p. vi).

2.1.5 Significance of lack of parity

The lack of parity between Aboriginal and Torres Strait Islander teachers or leaders and pupils in remote and very remote schools (as shown by NARIS data above) is stark (see Table 2-4).

Table 2-4 Proportions of Aboriginal and Torres Strait Islander staff and pupils in NARIS schools by state

Aboriginal and Torres Strait Islander personnel	**NARIS schools**	
	South Australia	Queensland
Teachers and Leaders	2.3%	15.6%
Pupils	94.3%	97.8%

Source: see text 2.1.4

In schools with almost 100% enrolments of Aboriginal and Torres Strait Islander children, there are very few Aboriginal and Torres Strait Islander teachers or leaders.

Why is this lack of parity considered an issue of concern? At the start of the decade a report was produced into the retention and graduation of Aboriginal and Torres Strait Islander students enrolled in ITE, which stated:

> Generally, the call for more Aboriginal and Torres Strait Islander teachers comes largely from the belief that the provision of role models will help to address historically poor outcomes for Aboriginal and Torres Strait Islander learners … The need for more Aboriginal and Torres Strait Islander teachers is currently framed within this discourse of parity and leadership. … Increasing the number of Aboriginal and Torres Strait Islander teachers is considered an issue of social justice, social change and social inclusion. In addition, Aboriginal and Torres Strait Islander teachers are critical in providing cultural diversity and Aboriginal and Torres Strait Islander knowledges for Australian students, both Indigenous and non-Indigenous. Qualified (and quality) Aboriginal and Torres Strait Islander teachers are seen as crucial in current discussions about the Australian Curriculum, and the requirement of the National Professional Standards for Teachers to embed Aboriginal and Torres Strait Islander knowledges in the curriculum (Patton et al., 2012, p. 14).

As has also been stressed by a report into the school workforce, Aboriginal and Torres Strait Islander teachers and leaders can modify content and delivery to be more culturally appropriate, their presence on the staff can be reassuring and make school seem less frightening, and their status as professionals can be a career inspiration for children.

Aboriginal and Torres Strait Islander teachers in remote Aboriginal and Torres Strait Islander communities are seen to improve educational outcomes of pupils in two main ways. First, they have deep cultural understandings and are able to support students' learning in what could otherwise be a mainly Westernised mode of formal education, as elucidated by Bin-Sallik and Smibert (1998, p. 104): "It is only through the mediating role of Aboriginal teachers that the compromise of formal [W]estern education in traditionally-oriented communities can hope to work." Local AEWs and teachers are seen as "the best educators on the lands because … they know the language and understand family issues and kin relationships, as well as appropriate behaviour management and what is important for the students to learn" (MacGill, 1999, p. 1652). More recent comments affirm "Current South Australian research indicates that Aboriginal students' motivation and academic achievement are improved by culturally responsive curriculum and relationships, as well as contact with more Aboriginal teachers and staff" (Department for Education and Child Development, 2013, p. 16).

Second, Aboriginal and Torres Strait Islander teachers provide work-force continuity by "potentially reducing the impact of high teacher turnover in school communities" (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 22). MacGill (1999, p. 1652) asserted the importance of the ties to country for Aboriginal and Torres Strait Islander people and the impact on schooling outcomes: "It is clear that AEWs and A[n]angu teachers are generally the best educators on the lands because they live and teach there permanently". In 2011, the then Australian Government Minister for School Education, Early Childhood and Youth noted the extent of the problem of high teacher turnover: "The current average length of service [for non-Indigenous teachers] in very remote [I]ndigenous communities in the Northern Territory is eight months, with a 40% annual teacher turnover rate" (Garrett, 2011, p. 2). Non-Indigenous teacher churn is an issue in remote schools across jurisdictions (Lock, Budgen, Lunay, & Oakley, 2012; Maher, 2013). The same point has been echoed more recently: "One of the major challenges, particularly in remote schools was the repeat cycle of teacher turnover …" (ACIL Allen Consulting, 2014a, p. 102). Third, Aboriginal and Torres Strait Islander teachers provide a stable learning environment for pupils compared to the disrupted learning which results from multiple non-Indigenous teachers in the one year. This high turnover of non-Indigenous teachers "impacted on the consistency of tuition provided" (ACIL Allen Consulting, 2014a, p. 102). Moreover, as local teachers exercise leadership within schools, Maher suggests the social capital of the community is increased: "Indigenous teachers in remote Indigenous communities are likely to be or

become leaders as they accept the mandate from the community to fulfill the responsible role of full-fledged classroom teacher" (2013, p. 846).

This section discussed the level of Aboriginal and Torres Strait Islander staff with regard to national staffing generally and with respect to focus schools and NARIS schools in remote and very remote areas. It highlighted the significance of the lack of parity between the level of Aboriginal and Torres Strait Islander staff and pupils in schools in these areas. Historically most pre-service teachers in community-based ITE programs have come from remote and very remote areas. Higher completion rates for such programs could contribute to ameliorating the disparity between proportions of Aboriginal and Torres Strait Islander staff and students, and this could enhance Aboriginal and Torres Strait Islander pupil schooling outcomes. This background presents the context for the relevance of the current research to investigate the use of mobile devices to improve professional learning for Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs in very remote communities. In the next section, an overview of each of the programs is presented. The older of the two programs – AnTEP in South Australia – will be considered first.

2.2 Anangu Tertiary Education Program

2.2.1 Antecedents

AnTEP (first called Anangu Teacher Education Programme but now called Anangu Tertiary Education Program) was "intended for traditionally oriented Aboriginal people currently residing in the A[n]angu communities who wish to take on greater teaching responsibilities in South Australian A[n]angu schools [in the north-west of South Australia]" (Crawford, 1986, p. 44). Antecedents may be traced to the role of local teaching assistants in Christian mission schools operating from 1940 to 1971. These schools were conducted in vernacular and developed vernacular literacy. Older children helped teach this literacy to younger ones. Some school leavers were employed as teaching assistants to the non-Indigenous teacher. More specifically, these assistants "translated school readers and wrote traditional stories which were duplicated and made into graded reading texts. They also taught, number, religion, physical education and craft, supervised art lessons and assisted with singing" (William Howell Edwards, 2012, p. 28). The role of Anangu teaching assistants was copied in government schools that began to be established from 1971 onwards.

As the numbers of non-Indigenous teachers increased, Anangu "teacher aides expressed frustration at the fact that they lacked professional training and

recognition" (W.H. Edwards & Underwood, 2006, p. 112). Gale (1996, pp. 20-21) noted that a small number of Pitjantjatjara undertook teacher training courses during the 1970s at Batchelor College in the Northern Territory and at Torrens College of Advanced Education in Adelaide, South Australia, but none completed courses nor gained qualifications.

2.2.2 Planning for AnTEP

A report to the Education Department of South Australia about possible teacher training for Anangu included the following summary recommendations:

- That systematic training in a Pitjantjatjara settlement replace the present form of "on the job" training
- That opportunity for "outside" training be offered to those sufficiently equipped in English and in other respects
- That suitable arrangements be made for long term systematic training, aimed at standards sufficient to qualify aides and Aboriginal teachers for responsibility as class teachers (Penny, 1976, p. 5).

It was not until late 1979 that Torrens College of Advanced Education (now UniSA) was nominated to develop this training. Little progress was made until a coordinator was appointed in 1981 (Gale, 1996, p. 21). This person arranged for local people in the communities to collect opinions about proposals, and the following recommendation was presented: "The on-site organization of ANTEP [AnTEP] should be maintained and the ANTEP [AnTEP] Planning Committee should investigate the possibility of some students being able to pursue study while residing in Adelaide" (French-Kennedy, 1982, p. 21).

The course was designed with two qualifications: (1) Associate Diploma of Education (Anangu Education) comprising Stages 1 and 2 and equivalent to two years of full-time study, (2) Diploma of Teaching (Anangu Education) comprising the subsequent Stage 3, and thereby equivalent to three years of full-time study. The final award qualified graduates to have control of a class of pupils in Anangu schools, but not elsewhere (Gale, 1996, p. 18).

2.2.3 Intakes and sites

The first group of 10 students from several communities commenced full-time study with a resident lecturer in 1984, at Ernabella / Pukutja community in the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands of north-west South Australia. In 1986, a group of 12 full-time students started with an on-site lecturer at Yipirinya School in

Alice Springs in the Northern Territory; they were also working as teachers (Gale, 1996, pp. 21-22; Patrick-Rolf, 1990, pp. 31-32). Two years later, part-time study alongside work as AEWs in schools was adopted in six South Australian communities, with 28 students and tutors paid by the Education Department of South Australia. AnTEP students also attended occasional week-long workshops, either in the APY Lands, Alice Springs or Adelaide (Furler & Scott, 1988; Patrick-Rolf, 1990, p. 32). A fourth intake of students living at Yalata, another South Australian community outside the APY Lands, began part-time study in 1989 (Gale, 1996, p. 19).

It took from 1984 to 1991 for the first students (three of the group of 10) to graduate with a Diploma of Teaching (Anangu Education) – the highest award at the time. The long time taken for the small number of graduates was of concern to stakeholders. In 1992, full-time on-site lecturers were placed at other communities in the APY Lands so some students could study full time. At the request of the Education Department of South Australia, in 1995 all AEWs working in the Anangu schools were enrolled in AnTEP (Gale, 1996, p. 22). This meant group intakes ceased, as AEWs entered the program as individuals.

In the period 2001–2010, 132 people commenced study in the program. In the same period, across all students enrolled in AnTEP, the number and percentage of full-time students per year decreased, and figures for part-time students increased, while the total number of students fell (Lea, Tootell, Wolgemuth, Halkon, & Douglas, 2008, p. 111). The drop in numbers of students was due partly to decreased funding for tutors in schools and partly due to students not wishing to have a debt to the government for fees (AnTEP, 2011, p. 7). As will be discussed in section 2.2.6, the course entered a wind-down phase in 2012 and was no longer offered from 2014 (AnTEP, 2011, p. 1).

2.2.4 Information and communications technology

ICT has played a small role in the history of AnTEP. The program began with face-to-face teaching for full-time students by a resident lecturer at one community in the APY Lands. It was not expected that ICT would be a major part of delivery. Within two years of the program's start, one staff member commented on the possibility of using the school's computer in teaching about mathematics: "The prospective students have already expressed much interest in learning to use this [computer]" (Crawford, 1986, pp. 50-51). However, there is no published record of this being implemented. The next mention of ICT use is six years later. George (1992) discussed issues about appropriate distance technologies for AnTEP, in the light of

funding issues, learners' experiences and a planned upgrade to telephone lines in communities during 1992–1994. A computer, printer, software and modem, along with a hands-free telephone, were set up at three sites. The trial focused on the use of an audiographics computer program and interactive computer-based study modules. Kemelfield, George and Houley (1994) noted challenges relating to varied skills of students at different sites during audio conferencing. Staff also had difficulties in designing modules that had clear logic for independent study and that used unambiguous terms and concepts. A few years later, this use of ICT was described unfavourably: "Unfortunately technology problems combined with the isolation have made this approach frustrating" (Bin-Sallik & Smibert, 1998, p. 100).

Neither of the two major historical reviews of AnTEP, by Gale (1996) or Edwards and Underwood (2006), mention the use of ICT. The 2006 AnTEP Annual Program Report does mention it:

> Some multimedia delivery and online delivery methodologies are used to complement face-to-face teaching. However future developments in this area are hindered by the high cost of development of online materials designed to meet the needs of Ananngu students. AnTEP continues to make limited use of the videoconference link between Ernabella and Adelaide (Mawson Lakes Campus) to ensure efficient use of staff resources as well as to provide opportunities for students to practi[s]e their oral English skills. During 2007 AnTEP will begin use of Centra software for both staff meetings and student teaching (AnTEP, 2006, p. 4).

The following year a report included these comments:

> The issue of reliability and speed of communication between AnTEP in Adelaide (based at Mawson Lakes) is continuing. The ISDN connection between Adelaide and Ernabella costs the AnTEP program $20,000.00 per year. Excellent support from Division of EASSS staff and ISTS staff ensures that AnTEP staff are able to make the best of the remote location and the challenges that provides. Investigations into a satellite service are on hold whilst developments occur due to Commonwealth Government funding of remote community broadband access (AnTEP, 2007, p. 29).

None of the curriculum materials were available online to either tutors or students prior to 2013, and since then have only been available to tutors (I. Thomson, personal communication, April 9, 2015). In summary, AnTEP has made minimal use of ICT.

2.2.5 Graduates

From its inception in 1984 up to December 2010, AnTEP graduated 90 Stage 1, 47 Stage 2 and 21 Stage 3 students (AnTEP, 2011). The website showed an additional

12 Stage 2 graduates and four more Stage 3 graduates in the period 2011–2013 (AnTEP, 2013). The *AnTEP News* magazine of August 2015 listed two more Stage 2 graduates and one more Stage 3 graduate (Underwood & Thomson, 2015). Compiling these figures gives totals to August 2015 of Stage 1 = 90, Stage 2 = 61, Stage 3 = 26. Completion rates are not available.

Of the 26 who completed Stage 3 – first named Diploma of Teaching (Anangu Education) and later named Bachelor of Teaching (Anangu Education) – three took up positions as teachers with responsibility for a classroom of pupils, and five others chose not to work as independent teachers, but arranged team-teaching partnerships with other staff (Smibert, 1998, p. 34). After 1998, numbers are not available to indicate how many graduated and preferred to work as AEWs, nor how many took up full responsibilities for classes of pupils nor how many negotiated agreements to have responsibility for designated curriculum areas, across a range of classes.

2.2.6 Current status

In late 2007, the South Australian Department of Education and Children's Services commissioned a review of post-primary education and pathways, including AnTEP for people in the APY Lands. The report was not released by the Pitjantjatjara Yankunytjatjara Education Committee until July 2009 (Paper Tracker, 2009). Regarding AnTEP, a summary statement was terse: "AnTEP clearly does not have the capacity to deliver a mainstream teacher certification program given its current delivery structure"(Lea et al., 2008, p. 113). The review made five recommendations about AnTEP:

> That AnTEP be resourced to radically increase the number of students. In particular AnTEP shuld [sic] seek to recruit greater numbers of male students to provide a stronger message to Ananangu 'youngfellas' that education is men's business too.
>
> An Ananangu Tertiary Enabling Program be developed by the University of South Australia (UniSA) to provide students with the literacy, numeracy and academic skills to complete AnTEP and other tertiary programs.
>
> That a fourth and fifth year program be offered on the APY Lands that would qualify Ananangu teachers for registration to instruct in ANY Australian school.
>
> That AnTEP be funded to employ expert lecturers to deliver workshops and modules to an upgraded and evidence-based curriculum. AnTEP tutors should focus on assisting students with assignments and remedial instruction.
>
> That a post secondary training facility on the APY Lands offer tertiary training courses and programs that would train Ananangu and non-Ananangu to pursue qualifications in the skills required to provide high quality education from primary to secondary on the APY Lands. These include courses and certificate programs in early childhood education, techniques for remediating hearing and vision deficits and literacy and numeracy instruction and tutoring and a mainstream education degree for Ananangu teachers (Lea et al., 2008, pp. 38-39).

I have been unable to locate a response by UniSA to those recommendations. As part of the process of a five-year internal review of AnTEP, in 2010 UniSA conducted conversations with 43 Ananangu and four secondary students on the APY Lands. The report listed 13 "emerging themes"; a selection of these is presented here.

- Reduced funding for tutors has decreased tutor time with pre-service teachers
- the obligation to repay loans received under the Higher Education Contribution Scheme "has been a tremendous disincentive to continue studying"
- A large number of participants were clear that they did not want to pursue a future career as a registered teacher but expressed a desire to have training and support available for their role as an AEW or also to look at other fields of employment
- Many participants expressed the feeling of a serious dislocation between AnTEP directions and school priorities. Many Ananangu felt that the focus on school pupils achieving literacy [in English] and numeracy benchmarks left little time for other areas, particularly Ananangu culture and language, which are promoted throughout AnTEP training (S. Osborne & Underwood, 2010, pp. 4-6).

In 2011, UniSA decided to re-accredit AnTEP for 2012 and to not offer the program after 2013 (AnTEP, 2011, p. 1). The decision was made partly on the basis of graduate outcomes and also because of national regulations regarding accreditation of ITE programs. As the current Vice Chancellor remarked recently, "Accreditation externalities have precipitated a need for change; indeed, they were dictating the end of the programme in its current format" (D. Lloyd, 2016b). This information was not available to me during 2011 when I was considering doctoral study. Thus, my

research was done during the wind down phase of AnTEP.

However, the research has significant value in contributing to future initiatives relating to tertiary study for Ananngu in the APY Lands and other places (and potentially other Aboriginal and Torres Strait Islander students in very remote communities). These new approaches include the use of online material. In 2014, a trial commenced with three selected students entering a modified version of the Foundation Studies program of UniSA College (I. Thomson, personal communication, August 22, 2014). Since then, UniSA has established the Indigenous Participation Pathway program, which is completed over 18 months through intensive study blocks at four regional locations as well as study in the students' home places Study at home includes online tutoring sessions. On completion, students can do a UniSA College diploma or apply directly to do a university degree (Stone, 2016; UniSA College, 2016). Two students from the APY Lands have commenced this program (McArdle, 2016). In March 2016, a delegation of senior personnel from UniSA visited the APY Lands to discuss future strategies (D. Lloyd, 2016a). As online practices become a feature of UniSA approaches in the APY Lands and remote areas, it is highly likely that tertiary students will use mobile devices for their study. Hence, this research may provide an evidence base for future decision-making.

2.3 RATEP: Community-based Indigenous Teacher Education

2.3.1 Antecedents

Three programs provided the foundation for the Remote Area Teacher Education Program (RATEP) which began in 1990. Kedron Park Teachers College (now merged into Queensland University of Technology) in Brisbane offered the first of these: one- or two-year training courses for Torres Strait Islander primary school teachers, who were known as Community Teachers. The courses did not lead to a formal teacher qualification (McGarvie, 1991, p. 27) and were "designed to equip them for teaching service in their own schools in the Torres Strait" (Miller, 1989, p. 218). There were also voluntary professional training seminars for Islander teachers held on Thursday Island over the Christmas break (Orr & Williamson, 1973, pp. 48-49). In the early 1970s, at the Brisbane course, the student pool was limited to10 per year. Authors of a report written in that period suggested this was slow: "At this rate of training, we could be looking into the twenty-first century before even the present contingent of Islander teachers is minimally trained" (Orr & Williamson, 1973, p. 49). In 1984, a team visited the area and later reported that there were about 20 schools

in the Torres Strait “in which there are over 50 Islander teachers … in a few cases, schools are operated entirely by unqualified Islander teachers” (D. Williams & Chambers, 1986, p. 110).

The training of Torres Strait Islander teachers was shifted to the then Cairns College of TAFE in 1983 (now TAFE Queensland North). The course at TAFE also accepted Aboriginal people. McGarvie (1991, p. 27) noted that for Aboriginal and Torres Strait Islander people from remote communities, the issue of moving away from home to a larger centre for long periods of study was problematic, and “the entrance rate and subsequent success rate to full teacher qualification has been extremely limited”.

The third course was the Aboriginal and Islander Teacher Education Program (AITEP). This began in 1977 at the then Townsville College of Advanced Education and in 1982 was continued by James Cook University of North Queensland (now James Cook University: JCU) (McGarvie, 1991), and led to a Diploma of Teaching with full teacher registration (McGarvie, 1991, p. 27; B. Osborne, 2003, p. 69). It offered two strands: one on Primary teaching and the other for Early Childhood Education. Loos and Miller (1989) provide a comprehensive picture of the first 10 years of the AITEP. For the period 1977–1985, there was a graduation rate of 39.5% (Henderson & Coombs, 1989, p. 19). AITEP ceased in 1989 (B. Osborne, 2003, p. 69).

2.3.2 Planning for RATEP

Given the low completion rates and peoples’ reluctance to relocate for study purposes, in 1987, both TAFE and JCU initiated research into new approaches (McGarvie, 1991, pp. 27-28). Shortly after, the Queensland Government adopted an Open Learning Project for Higher Education across the whole state. The intent was to use

> … information technology to create, and deliver, higher education courses to all Queenslanders, regardless of their location. Thus as part of this project, RATEP course delivery uses various aspects of information and interactive technology, with the vital addition of a tutor for the students at each site (McGarvie, 1991, p. 29).

Three concepts formed the platform on which RATEP was based: “social justice, education and technology” (Logan & Sachs, 1992, p. 193).

The initial partners cooperating to form RATEP were the Queensland Department of Education; Commonwealth Department of Employment, Education and Training; JCU of North Queensland; Cairns College of TAFE; the Queensland University of Technology and Aboriginal and Islander Consultative Groups (McGarvie, 1991, p.

30). The latter were identified as the Aboriginal Co-ordinating Committee, the Islander Co-ordinating Committee, the Torres Strait Islander Regional Educational Council and the Queensland Aboriginal and Torres Strait Islander Consultative Council (R. Smith & Macindoe, 1991, p. 142).

Logan and Sachs (1992, pp. 193-194) cite an undated position paper from the Queensland Department of Education, which outlined the original aims of RATEP:

- introduce decentralised on-site delivery of higher education (teacher education) in remote Aboriginal Islander Communities where none has previously been available
- produce qualified teachers with a greater measure of cross cultural awareness who will be more effective in the teaching of Aboriginal/Islander students, and who may remain for longer periods as teachers in their home Community or Island, thus to maintain greater stability and continuity
- introduce a variety of media modes for courseware delivery, but strive to retain the personal relationship imperative, which has shown itself to be the central factor in Aboriginal/Islander education success at all levels
- use full-time tutors on-site to assist and provide the 'transformer' relationship between student and institution.

RATEP was designed to provide articulation of awards: a one-year Certificate, a two-year Associate Diploma of Education, a three-year Diploma of Teaching and a four-year degree. The first two awards of TAFE were credited towards the latter awards from JCU (R. Smith & Macindoe, 1991, p. 142).

2.3.3 Intakes and sites

The first intake in 1990 comprised two groups of four students each on Masig (Yorke) Island and Badu Island in Torres Strait. All eight were Community Teachers (holding the Associate Diploma of Education) who were granted study leave for two years' full-time study to upgrade their qualification to the Diploma of Teaching. The second intake was in 1991, when students commenced at Hopevale and Aurukun communities on Cape York (McGarvie, 1991, pp. 30-31). The following year (1992), three more sites were added to give a total of 50 students (Sachs & Logan, 1993, p. 328). Over time, the number of sites increased, though not all were permanent. By 2004, 28 sites with resident teacher-coordinators had been established; generally, there were fewer than 20 such sites in any year (York & Henderson, 2003, p. 79).

Various manifestations of delivery developed apart from the main one where there was a group of students in one community with a resident teacher-coordinator. In some situations, the teacher-coordinator travelled to visit a second or third

community. In other cases, a teacher-coordinator was appointed as a permanent itinerant to visit students in various locations. Occasionally, a student who lived in one place would travel regularly to meet a teacher-coordinator. The scope of the program expanded, so that not just remote communities were serviced, but also students in rural and urban locations. Thus, the program adopted an expanded title which kept the familiar RATEP tag and identified inclusivity for all Aboriginal and Torres Strait Islander people: “RATEP – A community-based teacher education program for Indigenous peoples” (York & Henderson, 2003, p. 79).

At the start, funding was based on outcomes and released each year. Hence there was a need to test what was happening, and external evaluations reported strengths and pointed to matters needing improvement. In the first ten years of the program (1990–2000), there were 21 academic reports or articles on RATEP, which prompted York and Henderson (2003, p. 81) to assert “A research culture is embedded into RATEP”.

2.3.4 Information and communications technology

As indicated above, RATEP began within a larger project to use ICT to deliver higher education through the whole of Queensland. The program was designed as an ICT-based approach: “[RATEP] has a special brief to prepare and deliver higher education teacher education courses via information technology to Aboriginal and Torres Strait Islander students on-site in remote locations” (R. Smith & Macindoe, 1991, p. 139). The same authors pointed out, “Both preparation and delivery of RATEP courseware are based on the use of multimedia information technology. The notion is that such an approach can provide teaching and learing [sic learning] materials that are interesting, varied, interactive and culturally appropriate” (R. Smith & Macindoe, 1991, p. 141). The first sites were set up with a “computer, VCR [video cassette recorder], telephones, modem and a fax machine for course delivery” (McGarvie, 1991, p. 30).

Virtually all the published material on RATEP draws attention to the use of ICT in the program. Logan and Sachs (1992, p. 191) asserted the use of ICT offers “the means for teacher educators to attend to qualitative as well as to quantifiable learner characteristics; that is to personalise as distinct from individualise instruction.” Henderson (1992) explained further “Personalised learning through RATEP's interactive multimedia curriculum design caters for the integration of multiple cultural contexts” (p. 2). She suggested that various instructional design techniques with ICT promoted learning for Torres Strait Islanders, and claimed:

> The effects on students are those of self motivation, independence in learning, enthusiasm, empowerment through the content and ease of learning, and legitimation of their culture and learning style, for instance, through the avoidance of shame through private rehearsal of their understanding. Although the use of computer technology is not neutral and power resides with the educator, RATEP has developed subjects utilising current technology in culturally empowering ways (p. 4).

In a later paper, she argued for a multiple cultural model for instructional design "that promotes equity of outcomes for learners, particularly learners from disadvantaged minority groups" saying that such a model "strives for a coherent interplay among three cultural logics: those of the academic, mainstream and minority cultures" (Henderson, 1996, p. 94).

Henderson and Putt (1999b) looked at the use of audioconferencing and investigated perceptions of usefulness of different media to student learning. "Students ranked audioconferences and IMM [interactive multimedia] computer courseware first and equal in providing crucial learning experiences in a cross-cultural context" (Henderson & Putt, 1999a, p. 35).

At that time email was beginning to be used for administrative purposes, but had technical problems, and access to the internet was not provided to community sites "as the long-distance costs are exorbitant" (Henderson & Putt, 1999a, p. 36). However, two years later:

> Email has become an integral part of coursework to facilitate submission and return of assignments and, in several subjects, student-led tutorial discussions. Most RATEP students appreciate the efficiency and speed of communicating via email with their lecturers and fellow students. … Email has significantly reduced costs for facsimiles and telephone calls (York & Henderson, 2001, p. 141).

Email tutorials were seen as assisting students to take ownership of their learning, facilitating cooperative learning between students, and fostering engagement of students (York & Henderson, 2003, pp. 80-81).

Although use of the internet was delayed until 1998 due to hardware costs, service fees and unreliable connections, within a year, students indicated that internet use decreased feelings of isolation. Participation in an international online conference organised by JCU in 1999, enabled students to have "the opportunity to discuss relevant issues, particularly with other Indigenous Australian, Maori, and American students and scholars" (York & Henderson, 2001, p. 141).

An online learning community was established in 2005 through the use of online chats and instant messenger within TAFE's Learning Management System. This led to speedy completion, with 30 of 35 students who commenced the Diploma of

Education at the start of the year graduating the same year (Bartlett, 2006a, 2006b). RATEP now uses web-conferencing (Illuminate and Collaborate have been used in the past at TAFE, but it now uses Adobe Connect; Collaborate is used at JCU)(I. Hodges, personal communication, May 23, 2016). In 2012, RATEP instigated a pilot for off-site students in locations where there was no nearby learning centre or residential tutor. This happened at the same time as I began this PhD research. In summary, RATEP began as an ICT-based program and has continued to adopt advances in technology.

2.3.5 Graduates

In the period 1990–2015, there were 160 RATEP B.Ed. graduates from JCU (Halliday, Payne, & Linkson, 2015, p. 8). A 2012 survey of the 150 B.Ed. graduates between 1990 and 2011 indicated that most of these (107) were employed by Education Queensland (the state Department of Education and Training): 85 as teachers, 10 as leaders (principal / head of campus / deputy principal), six in project roles with Education Queensland and six doing other jobs with Education Queensland; others had various jobs (Mitchell & Linkson, 2012, pp. 6,30).

From commencement in 1990 to 2015, RATEP awarded over 1,000 qualifications at the Vocational Education and Training (VET) level through TAFE, that is Certificate III, Certificate IV and Diploma (Halliday et al., 2015, p. 8). In the period 2005–2010 there were 197 Diploma graduates, of whom 29 finished the JCU B.Ed. by the end of 2012. This demonstrated an overall completion rate from the diploma to the degree of 14.7%. Data for the same period suggested about 50% of the diploma graduates had started degree studies. Thus if only this cohort is considered, then 29 of 99 students graduating with a degree yields a completion rate of 29.3% (Mitchell & Linkson, 2012, pp. 26-27). Of the 197 Diploma graduates, 124 were interviewed of whom 50 stated they were employed by Education Queensland and 41 had other jobs (Mitchell & Linkson, 2012, p. 33).

2.3.6 Current status

Evaluations of RATEP over the years have been highly positive. Nielsen (1997, p. 313) discussed quality assurance in distance teacher education programs globally, citing RATEP as an “exemplary” example. RATEP received an Office of Learning and Teaching Award in 2012 for Programs that Enhance Learning regarding Educational Partnerships and Collaborations with Other Organisations. The citation included these comments:

> RATEP is a formidable partnership [with multiple stakeholders] … Graduates have achieved national acclaim, with one student awarded the highly competitive Governor General's Indigenous Student Teacher Scholarship (2012) and another ten awarded Pearl Duncan Teaching scholarships (Office for Learning and Teaching, 2012, p. 21).

In 2014–2015 RATEP operated from 16 sites and had off-site students in 22 other locations (Halliday et al., 2015, pp. 13,18). In 2016, 15 sites are operating with over 100 students doing Certificate III, Certificate IV and Diploma courses through TAFE and more than 30 enrolled in the B.Ed. course at JCU (Department of Education and Training, 2016).

2.4 Conclusion

This chapter began by highlighting the outcome of low completion rates for community-based ITE programs, that is, below parity levels of Aboriginal and Torres Strait Islander staff in the schooling workforce. It pointed out that if this is addressed, then the educational outcomes of Aboriginal and Torres Strait Islander school pupils in remote locations are likely to be improved through Aboriginal and Torres Strait Islander teachers assisting children to understand the curriculum and through providing workforce stability. In the second and third sections of the chapter, each of the two programs, which were the data sources of the research, were considered: first AnTEP, then RATEP.

Both programs have been operating for 25 years or more. AnTEP maintained a target student pool in terms of geography and linguistic background. It focused on face-to-face delivery, and had minimal use of ICT. The number of academic literature items specific to AnTEP is small. Only a few students have graduated and continued in the education workforce as restricted registered teachers. Given these facts and stricter national requirements for accreditation of ITE programs, AnTEP has ceased.

RATEP, on the other hand, broadened in scope beyond Cape York and the Torres Strait Islands to accept students throughout Queensland. From the beginning, it was based on the use of ICT, and has adopted new technologies as these have become available. There are a large number of academic articles about RATEP. The program has enrolled and graduated over 1,000 people, with 160 attaining a B.Ed. and eligibility for full registration as a teacher anywhere in Australia. A large proportion of these are still employed as teachers or other workers in the education sector.

This initial overview of the two community-based ITE programs indicates that

detailed research about the opinions and practices of pre-service teachers regarding the use of mobile devices in study towards an ITE qualification is opportune.

The next chapter considers a number of theories in order to be sensitised to concepts which may be pertinent to the construction of a Grounded Theory of enhancing professional learning through the use of mobile devices for tertiary study by these pre-service teachers.

3 THEORETICAL FRAMEWORK

The previous chapter presented an overview of the higher education sector in relation to ITE for Aboriginal and Torres Strait Islander people, with particular attention on two community-based programs: AnTEP in South Australia and RATEP in Queensland. The aim of the research is to discover how the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in remote communities.

This chapter has six sections followed by a conclusion. The first section introduces a rationale for the use of a phronetic approach to constructing Grounded Theory. Grounded Theory uses sensitising concepts to develop a theory that emerges from the research data. Sections 3.2–3.5 highlight several theoretical domains that contribute ideas relevant to the research context: theory relating to the adoption of technology; adult learning, including professional learning; mobile learning; and Aboriginal and Torres Strait Islander cultural philosophies. Possible relationships between these domains are represented in Figure 3-1, designed by the author.

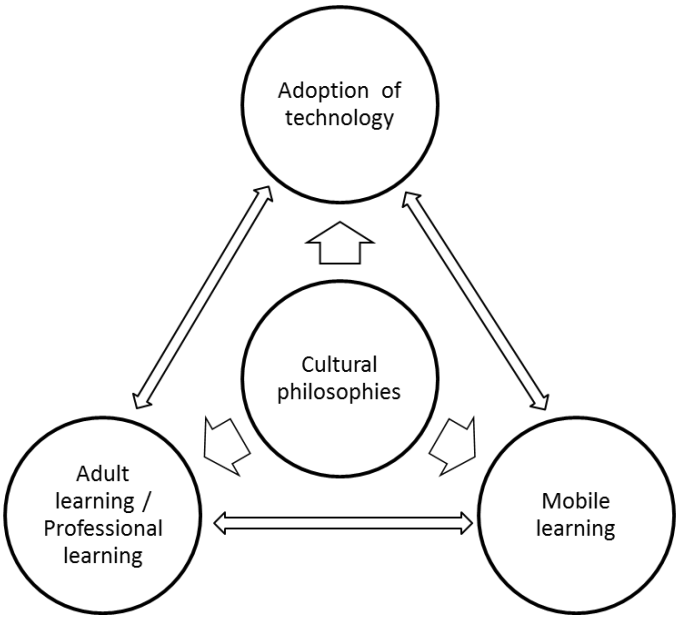

Figure 3-1 Theoretical domains as sources of sensitising concepts

The area of cultural philosophies has been placed centrally. This highlights the ethical imperative to valorise the perspectives of the participants who are Aboriginal and Torres Strait Islander people living in remote communities. Their cosmologies,

ontologies, epistemologies and axiologies influence the other domains. Hence there are arrows pointing out from cultural philosophies to each of the other domains. Two-way arrows between the other three domains indicate the interactions that may exist.

3.1 Selection of phronetic constructivist Grounded Theory

I acknowledge the fact that I am outside the colonised experience of Aboriginal and Torres Strait Islander people. It is protocol among Aboriginal and Torres Strait Islander people for visitors to state who they are, where they come from and the purpose of their visit, in order for connections to be made and relations established (Martin, 2003, p. 204). I shall do similarly with regard to this research. My name is Philip Bruce Townsend. I was born in Liverpool, a suburb of Sydney. My family lineage goes back to England and Scotland. I grew up in Adelaide and trained as a school teacher. After university I had 27 years of extensive cross-cultural experience in remote bilingual contexts. From 1984 to 1986 I taught at the bilingual school at Pipalyatjara community in the APY Lands in South Australia. Following this, I worked for many years in isolated locations in the Western Province of Papua New Guinea (1987–2009), primarily in bilingual adult religious education. After returning to Australia, I worked for Remote and Indigenous Ministry Support in Bible Society Australia (for six months across 2010–2011). I am married and have four children. My spirituality is expressed through my Christian faith. When I started this PhD, I was 52 years old.

In approaching this research I recognise the ethical demands upon me. Bainbridge, Whiteside and McCalman (2013) advocated a phronetic approach to constructing Grounded Theory. They drew on the work of Flyvbjerg (2001) which highlighted the importance of the researcher's ethics and values – phronesis. Flyvbjerg (2001) suggested the Aristotelian concept of phronesis may be understood "as prudence or practical wisdom" which "goes beyond both analytical, scientific knowledge (*episteme*) and technical knowledge or know-how (*techne*) and involves judgments and decisions made in the manner of a virtuoso social and political actor" (p.2). He pointed out that "reflexive analysis and discussion of values and interests … is at the core of *phronesis*" (p.3). Moreover there is a link between phronesis and action: "*Phronesis* is that intellectual activity most relevant to praxis. It focuses on what is variable, on that which cannot be encapsulated by universal rules, on specific cases" (p.57). Bainbridge et al. (2013, p. 285) asserted they had "integrated our being, knowing, and doing within the constructs of Aboriginal research methodologies, phronesis, and constructivist grounded theory". They suggested that

adopting a phronetic research approach

> enables movement beyond epistemologies centered on the privileges, beliefs, and experiences [of the researcher]. … In an Aboriginal Australian context, this places a premium on gaining insights into the experiences of Aboriginal populations and how their Aboriginality, unique ontologies, epistemologies, and specific heritage and cultures saturate the research experience. … Phronetic approaches as advocated by Flyvbjerg align well with Aboriginal ethical guidelines. [This is a strengths-based model of research which] focuses on the population's own resolves in life. It attends carefully to the voice of the research population by promoting them as experts in their own lives (Bainbridge et al., 2013, p. 277).

Grounded Theory interprets research data, particularly in exploratory contexts, in order to construct a theory which is based or grounded in the data itself. Rather than beginning with an existing theory and investigating whether or not the data fits that theory, Grounded Theory generates a new theory which emerges from the relationships within the data (Glaser & Strauss, 1967). Bainbridge et al. (2013, p. 276) claim "the integration of phronetic research epistemologies and constructivist grounded theory methods works alongside ethical and decolonizing practices in Aboriginal research agendas to create new knowledge".

Charmaz is a noted author on constructivist grounded theory. She has identified the following three features regarding its constructivist nature: both data and analyses are created by the viewer "through interaction with the viewed", that is, they are both social constructions formed through the interaction between the researcher and the participants (2000, pp. 523-524); each analysis reflects "its temporal, cultural and structural contexts", that is, a researcher's analysis indicates not only the specificities of the data but also the particular subjectivities of the researcher at the time of the analysis (Charmaz, 2006, p. 131); and constructivists "acknowledge that what they see – and don't see – rests on values", that is, the researcher's data and values are linked because the researcher's selection of what constitutes data is dependent on the values he or she holds (Charmaz, 2006, p. 131).

She has also commented on the relationship between data and theory: emergent theories are seen as "plausible accounts", that is, the researcher presents a theory as being credible because its justification is traceable to the data (Charmaz, 2006, p. 132); furthermore, "causality is suggestive, incomplete, and indeterminate … a grounded theory remains open to refinement", that is, the researcher makes no claim to incontrovertible truth regarding relations between elements in the theory; rather, he or she offers these from a desire for meaning-making and is willing to allow alternative explanations (Charmaz, 2000, p. 524).

Given the contested and complex nature of conducting research at the “cultural interface” (Nakata, 2003) with Aboriginal and Torres Strait Islander participants and a non-Indigenous researcher, then an interpretivist stance using a phronetic approach to constructivist Grounded Theory is the most appropriate and likely the most generative theoretical position for me to take. “Constructivist grounded theory lies squarely in the interpretive tradition” (Charmaz, 2006, p. 130). It does not avoid dealing with my privileged background, but recognises my own values and those of the participants. In a constructivist grounded theory “The theory *depends* on the researcher’s view” [emphasis in original] (Charmaz, 2006, p. 130). “Constructivism fosters researchers’ reflexivity about their *own* interpretations as well as those of their research participants” (Charmaz, 2006, p. 131).

Hence, in approaching this research I declare that I am a non-Indigenous, white, middle-class, Western, able-bodied, Christian, heterosexual, married male, without ties to any specific geographically based community (though a childhood resident and again an adult resident of suburbs near Blackwood in the Adelaide Hills) and with no claim to country. I have relationship roles as a husband, father, son, son-in-law, brother, brother-in-law, uncle, cousin, and nephew. I recognise that by accident of birth I am imbued with white privilege, arising from colonial systemic racism. Nevertheless, my personal expression of Christian spirituality rejects such racism, and I do not espouse “patriarchal white epistemic violence” (Moreton-Robinson, 2011). Rather, I recognise a common humanity expressed in mutual respect and shared interdependence. Most of my life has been lived as a guest in cultures different from the one into which I was born, and I am grateful to those who welcomed me to live alongside them, and who did not call me ‘Other’ but ‘Another’ and ‘Friend’ (Martin, 2008, p. 148).

Thus, in conducting this research, my purpose was to enable Aboriginal and Torres Strait Islander pre-service teachers to express their opinions about and identify their practices in the use of mobile devices in their tertiary study towards an ITE qualification through community-based programs, while living in very remote communities. In presenting the data I have sought to do so in a manner that gives the participants a voice that is heard beyond their own communities. Interpretation of the data and identification of the ramifications of those interpretations are my own. Yet I have attempted to be faithful to the meanings shared by the participants. My intention in compiling this thesis is that institutions will use the evidence provided by participants in this research to make decisions about ways of using mobile devices in courses.

Charmaz (2012, p. 4) asked and answered a rhetorical question: “Do we begin coding as a *tabula rasa*, encased in theoretical innocence and substantive ignorance? Not a chance”. She cited the notion of theoretical agnosticism and advocated for a critical recognition and examination of theoretical positions prior to and while conducting research. Charmaz (2000) stated that “grounded theory fosters the researcher’s viewing the data afresh, again and again, as he or she develops new ideas” (p. 526). She asserted that “those who take a constructivist approach aim to show the complexities of particular worlds, views, and actions” (Charmaz, 2006, p. 132). Coding is a process of ascribing a label to a piece of data as a step in analysis and will be described further in section 5.4.1.3). She has outlined a practical starting point for analysis of data: “I also advocate beginning coding with general sensitizing concepts” (Charmaz, 2012, pp. 4-5), and explained her term:

> Sensitizing concepts give researchers initial but tentative ideas to pursue and questions to raise about their topics. Grounded theorists use sensitizing concepts as tentative tools for developing their ideas about processes that they define in their data. If particular sensitizing concepts prove to be irrelevant, then we dispense with them (Charmaz, 2014, p. 30).

In summary, this first section has argued for my choice of phronetic constructivist Grounded Theory as the theoretical framework for this research. Subsequent sections look briefly at four theoretical domains: adoption of technology; adult learning, including professional learning; mobile learning; and Aboriginal and Torres Strait Islander cultural philosophies. This is done in order to generate awareness of sensitising concepts that are useful to the emergence of a Grounded Theory relevant to the aim of the research: to discover how mobile device usage by Aboriginal and Torres Strait Islander pre-service teachers might enhance their professional learning in community-based ITE programs. The next section considers theory relating to the adoption of technology

3.2 Adoption of technology

The earlier diagram of the four theoretical domains is repeated (see Figure 3-2), with a highlight on the domain of “Adoption of technology”. This section surveys theories about the adoption of technology in order to garner sensitising concepts that may assist in initial coding of data leading to the emergence of a Grounded Theory.

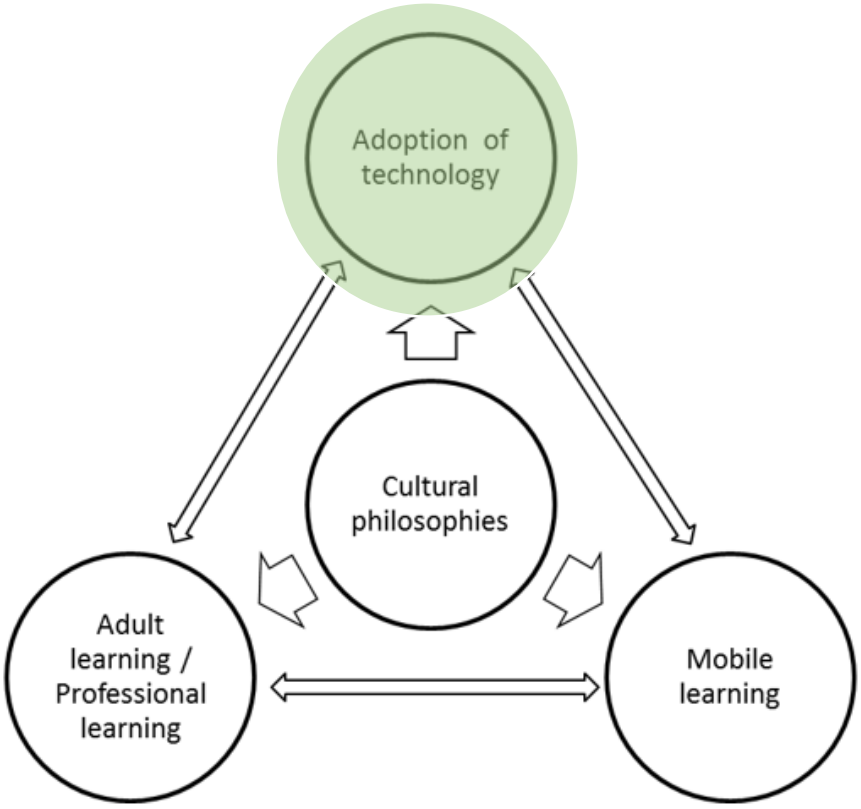

Figure 3-2 Adoption of technology theories as sources of sensitising concepts

Weber and Kauffman (2011) suggested there are three broad categories of theories that address technology adoption: theories about diffusion, theories involving behavioural perspectives and theories involving economic issues. As this research examines the opinions and practices of Aboriginal and Torres Strait Islander pre-service teachers about mobile devices in tertiary study, then it is appropriate to have an overview of the category of behavioural theories relating to an individual's willingness to adopt a technology. Four theories were chosen because of their prominence in the literature, and a fifth was selected because it directly addresses adoption of technology among Aboriginal and Torres Strait Islander people. This section considers the following five behavioural theories: Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and the Indigenous Household Adoption Model (IHAM). In relation to these behavioural perspectives, Weber and Kauffman (2011) also stated "culture appears to be an important construct that is worthy of further study" (2011, p. 686-687). Hence, a brief overview of each theory and recent areas of application are presented, followed by a discussion of the influence of culture.

3.2.1 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was proposed by Ajzen and Fishbein (1973; 1975) and suggests that attitudes and subjective norms affect behavioural intentions, that is they lead to a ”reasoned action”. TRA is a predictive model and has been used to predict an individual’s actions. Attitudes are sets of beliefs about objects or actions which may foster or curtail an intention to perform the act. Subjective norms are the extent of social pressure as perceived by the individual to perform a behaviour. These are focused on whether significant others (e.g. family, friends, colleagues, bosses, society in general) would approve or disapprove of a certain act and the willingness of the individual to comply with such expectations. Intention is affected by the perceived level of effort required to perform the behaviour. A simplified model is presented as Figure 3-3:

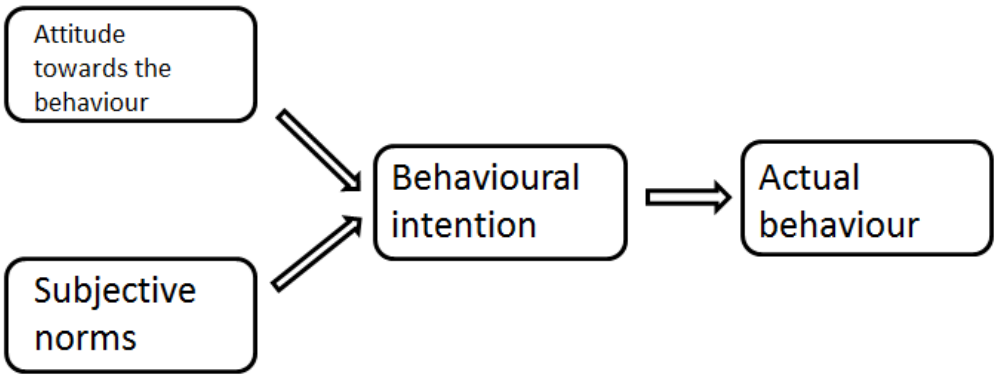

Figure 3-3 Theory of Reasoned Action

Source: Fishbein and Ajzen (1975)

Recently, TRA has been applied to cyberbullying among USA college students (Doane, Pearson, & Kelley, 2014) and mobile commerce usage (Wunnava, 2015). Boster, Shaw, Carpenter and Lindsey (2014) investigated dynamic and longitudinal effects on the theory. The TRA encounters difficulties when circumstances are outside the control of the individual and also when many choices are present. In the current research with Aboriginal and Torres Strait Islander pre-service teachers in remote communities there are several factors about infrastructure (e.g. mobile network coverage and internet access) and costs of mobile devices and service fees which are not under the control of individuals. So too individuals are faced with a large range of models of mobile devices from which to choose. Hence the TRA is not considered an appropriate model to use.

3.2.2 Theory of Planned Behavior

The Theory of Planned Behavior (TPB) was developed in response to criticism of the TRA's inability to handle external factors outside of the control of the individual (Ajzen, 1985). Another factor – "perceived behavioral control" - was added (Ajzen, 1991). This is an estimation of the amount of control an individual feels she or he has with regards to performing a behaviour. It "refers to people's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 1991, p. 183). A model of the TPB is presented as Figure 3-4. Three recent studies using the TPB have included investigations of (1) mobile learning readiness in USA higher education (Cheon, Lee, Crooks, & Song, 2012), which found "college students' behavioral control was a key determinant in their intention to adopt m-learning" (p. 1061); (2) mobile shopping adoption (Yang, 2012) – about which the author stated:

> Consumer perception of mobile shopping control was a significant determinant in the adoption of mobile shopping, meaning that good functioning mobile phones that facilitate mobile shopping transactions easily (e.g., fast data processing capability, user friendly interface, unlimited data usage plan) are critical factors in the adoption of mobile shopping (p. 490).

and (3) mobile banking adoption (Aboelmaged & Gebba, 2013). However, in the last study, perceived behavioral control had "insignificant effect on the mobile banking adoption" (p. 45).

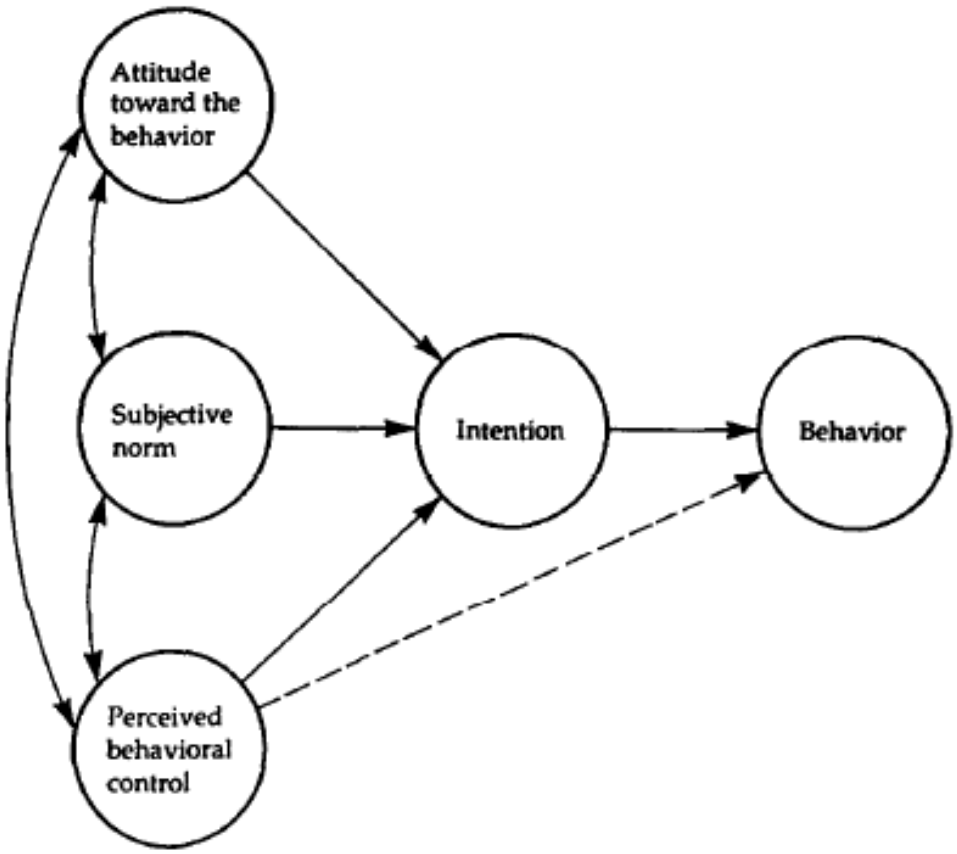

Figure 3-4 Theory of Planned Behavior

Source: Ajzen (1991, p. 182)

Results from the three studies about perceived behavioural control are mixed. As discussed with the TRA, contextual factors also limit the applicability of the TPB to the situation of tertiary students in remote Aboriginal and Torres Strait Islander communities.

3.2.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) proposed by Davis (1989) suggests perceived ease of use and perceived usefulness to be key factors affecting use of computers. Perceived ease of use refers to the degree to which a person believes the use of technology will be free of effort. Perceived usefulness is the degree to which a person believes using technology will enhance job performance. A model is shown as Figure 3-5 .

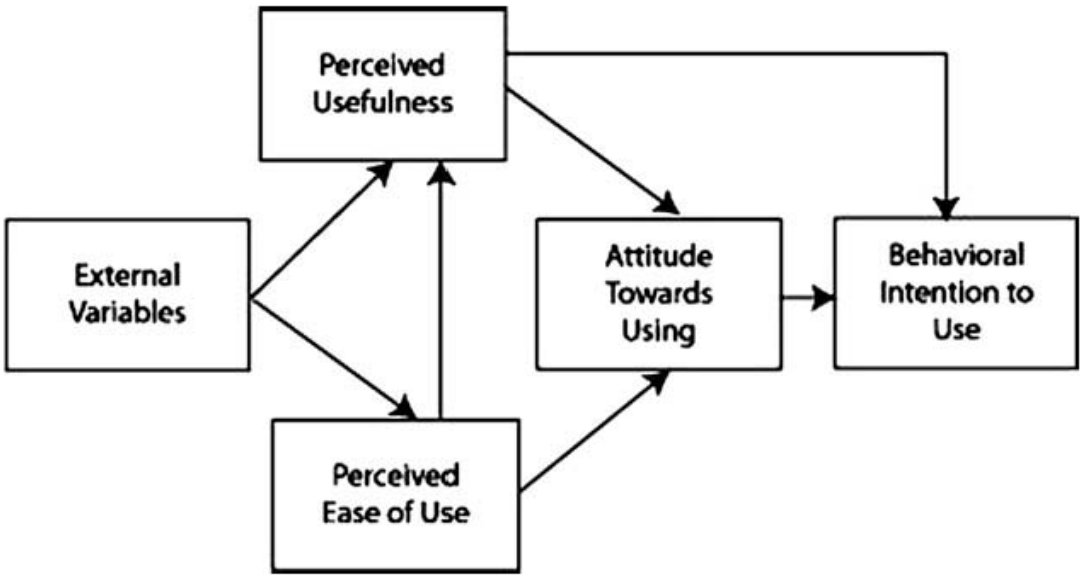

Figure 3-5 Technology Acceptance Model

Source: Davis (1989)

Recent studies using the TAM have investigated (1) technology acceptance by pre-service teachers in Singapore (Teo, 2009), (2) intention to use a learning management system among Malaysian pre-service teachers (Baleghi-Zadeh, Ayub, Mahmud, & Daud, 2014), and (3) the use of mobile instruction for Nigerian pre-service teachers (Adedoja & Morakinyo, 2014). These studies indicate that in addition to perceived ease of use and perceived usefulness, the pre-service teachers' self-efficacy is a factor in the acceptance of technology. Marangunić and Granić (2015, p. 90) presented a literature review of the TAM research (1986–2013) and identified four areas for future TAM research:

> The results indicate that TAM may not predict technology use across all cultures and that women and men differ in their perceptions, though not in technology usage. These findings suggest that researchers should include cultural differences as well as gender in models dealing with technology acceptance.

These elements about gender and culture for future research resonate with the features of this research where the majority of the participants are female Aboriginal and Torres Strait Islander pre-service teachers.

3.2.4 Unified Theory of Acceptance and Use of Technology

Venkatesh, Morris, Davis and Davis (2003) formulated the Unified Theory of Acceptance and Use of Technology (UTAUT), which was modified to Version 2 (Venkatesh, Thong, & Xu, 2012). The more recent version extends the first from an organisational context to a consumer use context by adding three variables: hedonic

motivation, price value and habit notions (see Figure 3-6). The UTAUT #2 is relevant to this research as it addresses the consumer use context which aligns with the common approach of non-mandatory Bring Your Own Device in tertiary study.

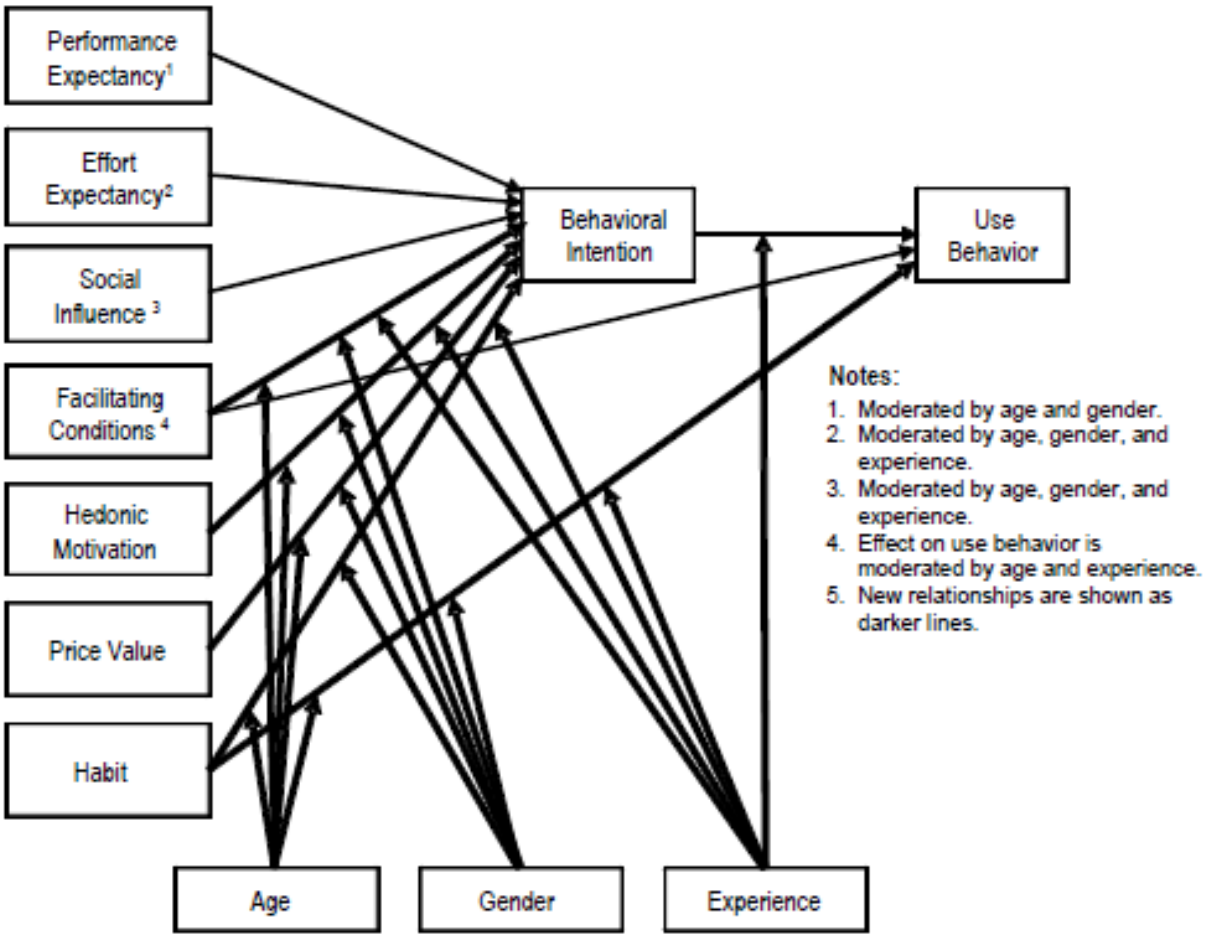

Figure 3-6 Unified Theory of Acceptance and Use of Technology 2

Source: Venkatesh, Thong and Xu (2012, p. 160)

Nistor, Lerche, Weinberger, Ceobanu and Heymann (2014) explored national culture and professional culture using a modified form of the Unified Theory of Acceptance and Use of Technology. They kept the four constructs of performance expectancy, effort expectancy, social influence, and facilitating condition, and added computer anxiety. They also incorporated three of Hofstede's (2001) national cultural dimensions– masculinity vs femininity, uncertainty avoidance and individualism vs collectivism – and contrasted data from two nations (see Figure 3-7). To determine the effect of professional culture they compared educational technology users with professions in the fields of science, technology, engineering or mathematics (STEM) and other professions (non-STEM). The study by Nistor et al. has relevance to this research as it addresses the issue of cultural background of educational technology users. Nevertheless, the suitability of Hofstede's national

cultural dimensions has been questioned and will be discussed further in section 3.2.6.

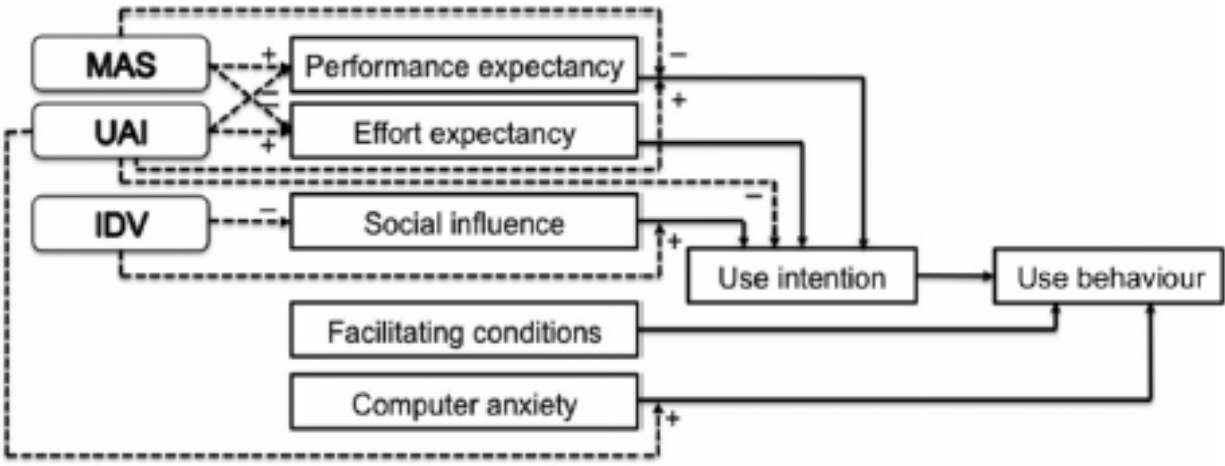

Figure 3-7 Integrating Hofstede's cultural dimensions into the Unified Theory of Acceptance and Use of Technology

Source: Nistor et al. (2014, p. 50)

3.2.5 Indigenous Household Adoption Model

Radoll (2010) presented the Indigenous Household Adoption Model (IHAM) in his PhD thesis. This was based on research among remote, rural and urban Aboriginal households. He identified four fields, one type of agent and several practices (see Figure 3-8). The Indigenous field is the objectified area of policies, and legal and administrative frameworks that govern Indigenous community organisations and people. By definition the Indigenous field can only have Indigenous agents in it. It is here that Indigenous households exist and Indigenous practices occur. These practices are affected by intersection with three other fields: employment, education and a social network of ICT adopters. In short, if the head of the Indigenous household uses ICT for employment or education purposes, or if children in the Indigenous household use ICT for schooling, or if there are ICT adopters in the social network, then these factors increase the likelihood of an Indigenous household adopting ICT, for example purchasing a desktop computer.

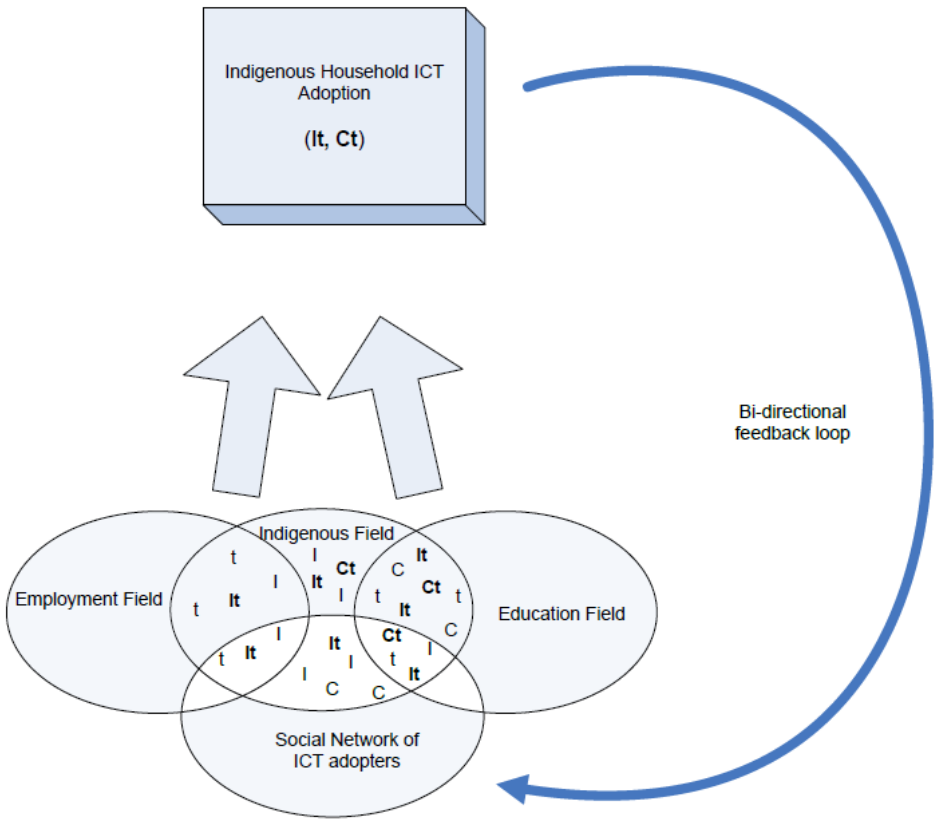

Figure 3-8 Successful Indigenous Household ICT Adoption Process

Source: Radoll (2010, p. 271)

No-one else has yet published research based on the IHAM. It was mentioned in one article seeking to review factors affecting ICT adoption for the preservation of Indigenous Knowledge (Ngcobo & Eyono Obono, 2013). The IHAM is relevant to this research as it addresses the adoption of technology by Aboriginal and Torres Strait Islander people and identifies education as a key influencing factor. However, this theoretical model is not specific to the particular target group (i.e. pre-service teachers as individuals rather than households in general), the technology (mobile devices rather than desktop computers) and purpose of ICT use (i.e. tertiary study rather than general ICT usage) that is being investigated for this research.

These five theories have been surveyed and various factors identified which may contribute to a person choosing to adopt technology. In the brief discussion of three

theories – TAM, UTAUT #2 and IHAM – the aspect of culture was raised. Given that this research intentionally focussed on Aboriginal and Torres Strait Islander people whose culture is different from mainstream Australian society it is appropriate to consider the nature of the term "culture" as it has been used in the literature about adoption of technology. This will determine whether current concepts are adequate or whether other aspects of culture may be more useful to this research. This will be discussed in more detail in the following section.

3.2.6 Cultural influences on adoption of technology

This section briefly summarises notions of culture proposed by Hofstede (2001; 1980), as his work is cited frequently in general literature about culture and also in material relating to use of technologies. This is followed by criticisms of his ideas and then other perspectives are raised. Hofstede (1980) initially proposed four dimensions of culture: power distance, individualism vs. collectivism, masculinity vs. femininity and uncertainty avoidance. His writings were based on data within one organisation with employees from several nations. However, his work has been criticised for invalid assumptions and weaknesses in data collection and analysis (Ess, 2009; McSweeney, 2002), including colonialist tendencies (Fougère and Moulettes, 2007). Tams (2013) pointed out an epistemological inconsistency, in that his research was conducted from a positivist stance, whereas culture is a socially constructed reality.

Ess and Sudweeks (2005) reviewed literature about culture and use of computers, including material that used Hofstede's cultural dimensions. Aryana and Øritsland (2010) reviewed culture and mobile human-computer interaction, noting the dominant place of Hofstede in the literature. Weber and Kauffman (2011, p. 694) raised questions about the impact of language and culture on the adoption of technology. Tams (2013, pp. 383-384) was critical of cultural research relating to ICT, and suggested it was "immature" as it "lack[ed] an adequate definition of culture; scholars tend to use country as a surrogate variable for culture, where nationality is implicitly accepted as a definition of culture". Regarding this area of culture and online learning, Gunawardena and Jung (2014, p. 1) suggested that "a definition of *culture* that is flexible, dynamic, and negotiable is more appropriate to understand the online learning context" [emphasis in original]. They proposed that culture be seen "as negotiated by online participants whose ethnic, gender and religious identities are enacted, concealed, or merged into hybrid identities" (Gunawardena & Jung, 2014, p. 7).

In summary, having looked at the five theories about adoption of technology, and

considering aspects of culture, a number of sensitising concepts may be seen to be relevant to this research about mobile devices for Aboriginal and Torres Strait Islander tertiary students in very remote communities. Subjective norms (TRA) and networks of ICT adopters (IHAM) can be seen in the extent to which mobile devices are used by peers and the social pressure to conform to such use or desire to emulate others. Perceived behavioural control (TPB) could include students' perception of the ease of using mobile devices for study purposes. Perceived usefulness (TAM) could include the extent to which students believe using a mobile device will enhance their study requirements / professional learning. Hedonic motivation (UTAUT #2) could include the degree to which students think using mobile devices for study purposes will be enjoyable. Factors such as age, gender, previous experience with mobile devices and culture are seen to have bearing on the adoption of mobile devices in educational contexts.

It is reasonable to conclude that the literature suggests the impact of culture on the use of technology is an issue worthy of investigation, and that positivist alleged national characteristics of cultures are insufficient to deal with the socially constructed features of culture. Thus for this research about the use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers, culture is likely to be an important issue, and it is appropriate to consider this through a qualitative constructivist Grounded Theory approach. Hence, it will be apposite to be alert to elements of cultural philosophies such as cosmology, ontology, epistemology and axiology. These will be considered later in this chapter in section 3.5. This next section turns to the nature of the participants and the work they do, and so briefly surveys adult learning and professional learning in the context of tertiary students.

3.3 Adult learning and professional learning

The earlier diagram of the four theoretical domains is repeated (see Figure 3-9), with a highlight on the domain of "Adult learning / Professional learning". This section presents an overview of adult learning and some elements of professional learning in order to recognise sensitising concepts, which may help in initial coding of data in the process of developing a Grounded Theory.

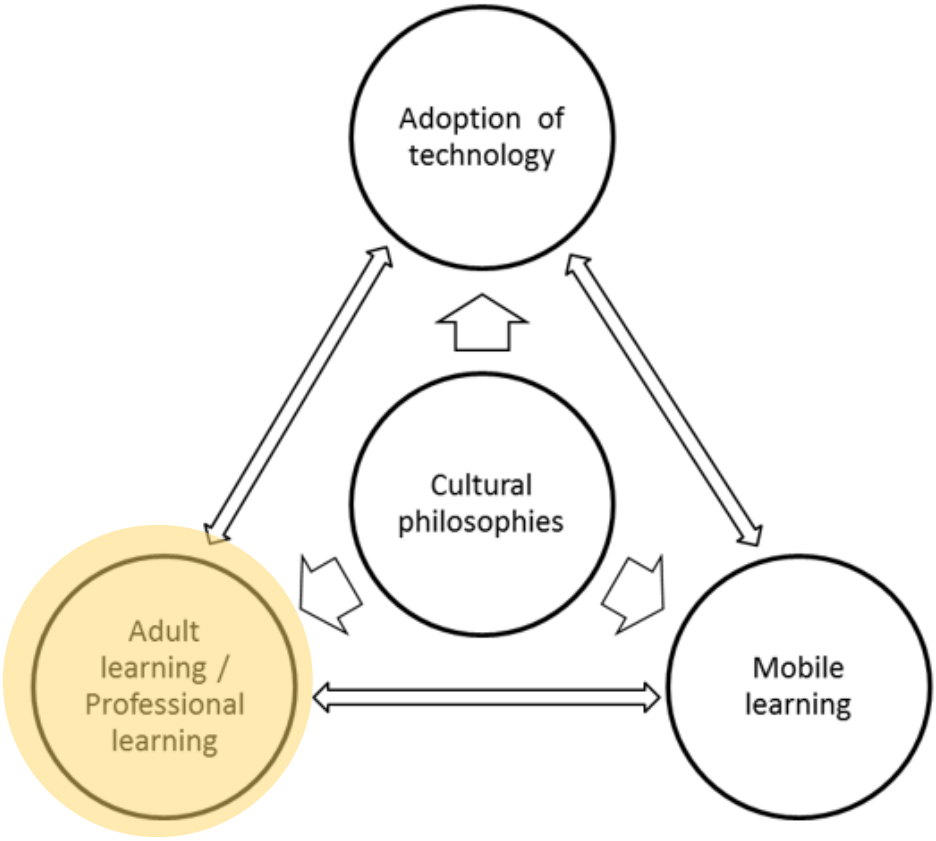

Figure 3-9 Adult learning theories and professional learning theories as sources of sensitising concepts

The focus of this research is on the views of Aboriginal and Torres Strait Islander pre-service teachers about the use of mobile devices for their tertiary study in community-based ITE programs, while living in very remote communities. Virtually all pre-service teachers are legal adults having already turned 18 years of age; occasionally in Queensland there are Year 11 or Year 12 school students under the age of 18 who are taking RATEP TAFE certificate-level courses that will lead to study towards a B.Ed. For the purposes of the research, I assumed pre-service teachers are adults. It is appropriate then to consider theories of adult learning and ask how they might relate to the learning of adult Aboriginal and Torres Strait Islander people, and this will form the first part of this section. Jasman (2016, p. 95) recently pointed out that “separating the fields of teacher education policy and practice into initial and continuing professional learning is acknowledged as an artificial distinction.” This quote is used here to justify my claim that, for the purpose of the research, the term ”professional learning” is legitimately applied to studying for an ITE qualification. It is appropriate then to consider theories of professional learning about ITE, as to how they might relate to the learning of adult Aboriginal and Torres Strait Islander pre-service teachers, and this will form the second part of

this section. The first part briefly looks at adult learning.

3.3.1 Adult learning

The legal age at which a person is considered an adult varies globally. Adult learning generally focuses on people who have left formal schooling. The field is broad and considers anything from informal ways adults choose to learn something of their own volition, to vocational training before employment, on-the-job training required by employers and professional upskilling. It can include developmental elements and aspects of ageing. A recent overview (Merriam & Bierema, 2014) identified three foundational theories of adult learning: andragogy, self-directed learning and transformative learning. A brief overview of these is presented to seek sensitising concepts for use in constructing a Grounded Theory.

3.3.1.1 Andragogy

Knowles (1973, 1980; 2011) is generally considered the pioneer of adult learning theory. He popularised the term “andragogy” (from the Greek, referring to a mature man / adult) in contrast to “pedagogy” (from the Greek, referring to a child). Andragogy has six assumptions about the characteristics of adults:

1. Adults consider themselves to be self-directing
2. Adults have life experiences which serve as a resource for further learning
3. Adults are keen to learn when issues relate to either their own development or social roles
4. Adults’ learning is problem-based and requires immediate application
5. Adults’ learning arises from their own internal motivation
6. Adults need to know the reason for learning something (Merriam & Bierema, 2014, p. 47).

A number of criticisms have been made about the focus on Western frameworks – regarding thinking and logic and the notion of a self-determining individual free of social constraints and systemic forces – and the narrow group of participants. Chan (2010, p. 32) suggested Knowles emphasised “[W]estern notions of rationality and analysis and does not consider the cultural imperatives and diversity in ways of knowing across cultures world-wide.” M. Lee (2003, p. 12) noted “Knowles has drawn his assumptions from a specific segment of the population. What has been left out from his theoretical framework are women, people of colour, working-class adults, adult immigrant learners, and other marginalized groups”. These comments are relevant in considering the participants in the current research, who are Aboriginal and Torres Strait Islander pre-service teachers (mainly women) living in

very remote communities.

3.3.1.2 Self-directed learning

Tough's studies on adults' self-initiated learning projects (1978) are considered the beginning of research in this area. He defined a learning project as "simply a major, highly deliberate effort to gain certain knowledge and skill (or to change in some other way)" (Tough, 1979, p. 1). Most of such projects were an on-going feature of a person's weekly life and were not reliant on an instructor. People generally planned the learning, worked at their own pace and gauged how they had progressed. A self-directed learner is one who:

> 1 exhibits initiative, independence, and persistence in learning;
>
> 2 accepts responsibility for his or her own learning and views problems as challenges, not obstacles;
>
> 3 is capable of self-discipline and has a high degree of curiosity;
>
> 4 has a strong desire to learn or change and is self-confident;
>
> 5 is able to use basic study skills, organize his or her time and set an appropriate pace for learning, and to develop a plan for completing work;
>
> 6 enjoys learning and has a tendency to be goal-oriented (Guglielmino, 2013, p. 3).

Chuprina and Durr (2006, p. 20) found a "strong correlation between self-directed learning readiness and cross-cultural adaptability" for expatriate managers in international postings. In the scenario with Aboriginal and Torres Strait Islander pre-service students entering the Western academic context, one wonders if the same correlation might be observed. In building the theoretical framework for my research, it is important to consider the extent to which self-directed learning for adults is endorsed within Aboriginal and Torres Strait Islander epistemologies. Epistemology is discussed in section 3.5.3.

3.3.1.3 Transformative learning

Mezirow (1990, 1991) is thought of as the first to comprehensively present transformative learning theory. He noted that when something is not congruent with previous interpretations, that is, when a person experiences a disorienting dilemma, this may generate a new way to make sense of life. He suggested a 10 step process through which people gain "meaning perspectives that are more inclusive, discriminative, permeable, and integrative of experience" (Mezirow, 1991, p. 225). This perspective change constitutes transformational learning.

In a handbook by E.W.Taylor and Cranton (2012), several authors raise the impacts

of various factors on transformative learning, such as spirituality (Charaniya, 2012), culture (Ntseane, 2012), gender (English & Irving, 2012), the community (Mejiuni, 2012), as well as the place of critical theory in relation to changes to social and economic power (Brookfield, 2012). Teachers' online communities of practice have been noted as sites for transformative learning (K. Lee & Brett, 2015). These same issues are of relevance to the research about mobile device use in tertiary study by Aboriginal and Torres Strait Islander pre-service teachers, most of whom are women living in very remote communities.

This section has briefly considered three theories of adult learning as a background to characteristics of the participants. The following section looks at professional learning as expressed by enrolment in a community-based ITE program.

3.3.2 Professional learning / initial teacher education

In considering professional learning as it relates to initial teacher education, I selected the issue of provision of quality ITE programs as an area which might provide sensitising concepts to promote the aim of the thesis to discover how the use of mobile technologies might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities.

Jasman (2016, p. 103) suggested that "in Australia the main policy implemented to improve the quality of ITE during the period between 2003 and 2013 was the codification and description of teachers' work through national professional standards for teachers and teaching". She pointed to three ways this has occurred: setting requirements for accreditation of programs, prescribing course delivery and professional experience and assessing student performance. As indicated in Chapter 2, these measures have had a direct impact on this research, as AnTEP could not meet the accreditation requirements and was in a wind-down phase while this research was being conducted.

The organisation overseeing these policies is the Australian Institute for Teaching and School Leadership (AITSL), and has established *The National Professional Standards for Teachers*, which have 37 focus areas across seven standards. Alongside this document is another which outlines ICT Statements for Graduate Standards. It sets out ICT competencies that must be demonstrated for each of the focus areas across the seven standards. Of the 37 focus areas, only three mention ICT in the descriptor. These three are therefore of particular interest to this research examining the use of mobile devices by pre-service teachers; they are each listed with their standard, descriptor and ICT statement:

Standard 2: Know the content and how to teach it

2.6 Focus Area = Information and Communication Technology (ICT)

Descriptor: Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.

ICT Statement: Demonstrate the ability to use a range of digital resources and tools in ways that enable deep engagement with curriculum and support a range of approaches to learning.

Standard 3: Plan for and implement effective teaching and learning

3.4 Focus Area = Select and use resources

Descriptor: Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.

ICT Statement: Demonstrate knowledge of the use of digital resources and tools to support students in locating, analysing, evaluating and processing information when engaged in learning.

Standard 4: Create and maintain supportive and safe learning environments

4.5 Focus Area = Use ICT safely, responsibly and ethically

Descriptor: Demonstrate an understanding of the relevant issues and the strategies available to support the safe, responsible and ethical use of ICT in learning and teaching.

ICT Statement: Demonstrate understanding of safe, legal and ethical use of digital resources and tools, including cyber safety practices, respect for copyright, intellectual property, and the appropriate documentation of sources. (The Australian Institute for Teaching and School Leadership, nd, pp. 2-4)

These three focus areas describe the standards an ITE student must have in order to graduate at the end of his or her course and gain a qualification. The ICT statements include the term “use of / use a range of digital resources and tools”. In order for students to meet each of these focus areas and achieve the seven standards before graduation, it is essential that they use digital resources and tools within their study and training. Hence the use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers in their tertiary study aligns with these Graduate Standards and is likely to enhance professional learning within their ITE programs.

Another issue relevant to the focus of this research on mobile devices is the “acceleration in the development of digital devices that can impact on access to, effectiveness and efficiency of learning and the exponential expansion of knowledge

within education both theoretically and practically" (Jasman, 2016, p. 108). It has been suggested this rapid change affects ITE at three levels:

> First the provision of appropriate learning experiences within ITE programs, the capacity of existing initial teacher education lecturers to model and extend the students['] engagement with ICT in the classroom, and third, assuring that graduates from ITE programs have a range of skills not only in the use of ICTs for their own activities but also to incorporate relevant ICTs to enhance the learning skills of their students (Jasman, 2016, p. 108).

The use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers living in very remote communities is seen as being incorporated in each of these three levels of impact on ITE programs.

In summary, having looked at the three theories about adult learning, as well as considering the requirements about the use of ICT within Professional Standards for ITE graduates as an aspect of quality professional learning, numerous sensitising concepts are noted as relevant to this research about mobile devices for Aboriginal and Torres Strait Islander tertiary students in very remote communities. The aspect of adults exhibiting interest in learning relating to social roles perhaps aligns with the use of mobile devices by pre-service teachers to fulfil their roles as students. The use of mobile devices could allow immediate attention to solving learning problems. Pre-service teachers have an internal motivation of a career goal to become a teacher and the use of mobile devices may help them achieve that aspiration. The use of mobile devices might enable students to be self-directed in their learning and facilitates initiative, resilience and self-discipline as well as the capacity to manage time among competing demands, including cultural obligations. Pre-service teachers generally embark on their study with the overt goal of being transformed into a professional member of the workforce – with a new identity as a registered school teacher. The use of mobile devices by pre-service teachers possibly fosters these transformative changes through interactions among members of online communities of practice, which may include fellow students, support teachers, lecturers and administrative personnel. It is a requirement that students use ICT or digital resources and tools in order to meet professional standards for graduate teachers. Using mobile devices within their ITE course is likely to help them fulfil this imperative and enhance the effectiveness and efficiency of their professional learning. The next section considers the nature of mobile learning – its essential elements and relations between these.

3.4 Mobile learning

The earlier diagram of the four theoretical domains is repeated (see Figure 3-10),

with a highlight on the domain of ‘Mobile learning.’ This section presents an overview of mobile learning in order to distinguish sensitising concepts, for coding of data in the task of developing a Grounded Theory.

This thesis is particularly concerned with educational uses of mobile devices. Significant technological advances can be identified with the release of two products by Apple: the iPhone in 2007, and the iPad in 2010. There has been general popular global uptake of these devices and similar products from other manufacturers. In addition, such products are increasingly used in educational contexts. Given the impact of tablets in educational settings, this section will limit remarks to literature addressing issues since 2010. In that period numerous reviews of the literature have been produced (Alrasheedi, Capretz, & Raza, 2015; Crompton, Burke, Gregory, & Gräbe, 2016; Liu, Geurtz, Karam, Navarrete, & Scordino, 2013; Liu et al., 2014).

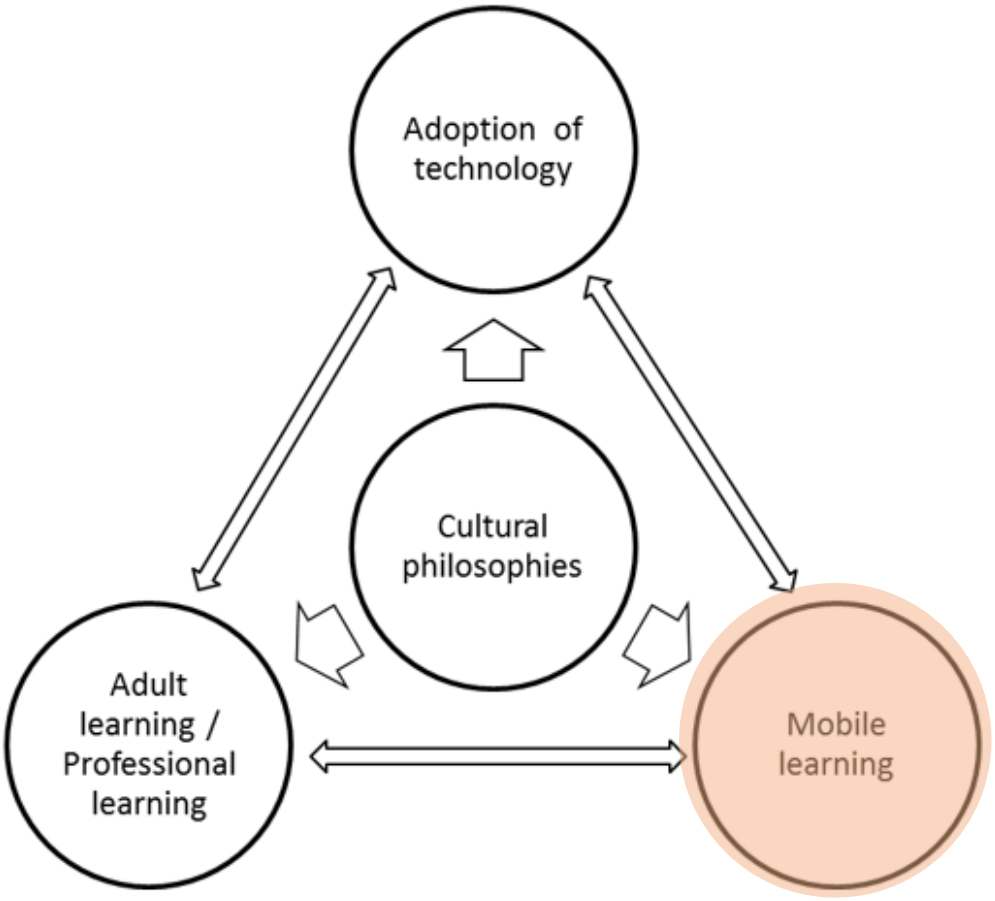

Figure 3-10 Mobile learning theories as sources of sensitising concepts

3.4.1 Definitions

The question “What is mobile learning?” is fundamental to the framing of my

research. Naismith, Lonsdale, Vavoula and Sharples (2004, pp. 2-4) presented a review of the literature on mobile technologies and learning and suggested there were “six broad theory-based categories of activity”: behaviourist, constructivist, situated, collaborative, informal and lifelong, and learning and teaching support. A further survey from 2005 to early 2012 led Imtinan, Chang, and Issa (2014, p. 327) to propose three definitional perspectives: “techno-centric, learner centered and augmentation of mobile learning with learning theories”. Nevertheless, Bannan, Cook and Pachler stated, “there continues to be a distinct lack of definitional clarity about mobile learning” (Bannan, Cook, & Pachler, 2015, p. 2). Similarly, Crompton, Burke, Gregory and Gräbe recently referred to “a number of ephemeral definitions of mobile learning” (2016, p. 150). Bannan et al. “asserted a socio-cultural view of learning whereby mobile devices and services foster inter- and intra-personal conversation-based processes of coming to know” (Bannan et al., 2015, p. 13). Given the primacy of relationships among Aboriginal and Torres Strait Islander people (see section 3.5), such a view of mobile learning holds promise for understanding participants’ perspectives. For the purposes of this research, mobile learning refers to the ways people come to know that involve interactions between themselves, others and content, facilitated through the use of mobile devices.

3.4.2 Design principles

This section points to a number of factors involved in mobile learning and then focuses on work by Kearney and colleagues. Crompton et al. (2016, p. 150) proposed four central constructs of mobile learning: pedagogy, technological devices, context, and social interactions. Churchill, Lu and Chiu (2014, p. 163) suggested mobile learning design falls into three paradigms: “learning with mobile technologies, … learners on the move, … and dynamic, seamless and ubiquitous learning experiences”. A recent work presented several positions (Churchill, Lu, Chiu, & Fox, 2016). Churchill, Fox and King (2016, p. 21) proposed the Resources-Activity-Support-Evaluation (RASE) learning design framework. They emphasised the activity component and suggested that activities must be learning-centred and authentic. The authors identified seven affordances or essential properties of mobile devices: resources, connectivity, collaboration, representation, capture, analytical and administrative tools (Churchill, Lu, et al., 2016, p. 21).

Kearney, Schuck, Burden and Aubusson (2012) proposed a pedagogical framework of mobile learning and suggested there is a dynamic interaction between the use of space and time and mobile learning experiences. They identified three constructs of mobile learning: personalisation, authenticity, and collaboration. Each construct had two sub-scales. Personalisation involves agency (control over place, pace and time

and goals of learning) and customisation (the ability to modify both activities and the mobile device itself). Authentic learning happens when a learner is in a simulated field relevant to the real world (contextualisation) or when a person participates in a genuine community of practice (situatedness). Collaboration occurs when there is extended dialogue (conversation) and also involves using, swapping and jointly producing material (data exchange).

Recently, Burden and Kearney (2016) presented a three-dimensional model of authentic mobile learning. They identified three vectors – context, planning design and personal relevance – each with a continuum between two features. Context is where learning occurs; it varies between simulated and participative features. Planning design refers both to the extent to which activities are predefined or emergent and to the agency of the learner. Personal relevance identifies whether a learner is detached or engaged. The article claimed that the use of mobile devices leads to "blurring the boundaries between simulated and participative forms of real-world learning, between predefined and emergent models of learning and between high or low levels of personal engagement and meaning making" (Burden & Kearney, 2016, p. 38). Literature cited thus far has had a general purview, in contrast, Cochrane and Narayan (2016) reported three key elements of professional development for higher education lecturers through social media on mobile devices: modelling a community of practice, redefining pedagogy and designing an appropriate technology support infrastructure.

In summary, this overview of definitions and design principles of mobile learning makes it possible to identify sensitising concepts germane to this research about mobile devices for Aboriginal and Torres Strait Islander tertiary students in very remote communities. The specific mobile device itself is not important; rather, its functionality and affordances are key. It is anticipated that research participants will have a range of models of mobile devices. The seven affordances listed earlier are likely to enhance professional learning. The social-cultural, interactive and collaborative aspects of social uses of mobile devices are expected to be transferable to education contexts. Aspects of authenticity to the tasks of being a tertiary student are seen as relevant. Personalisation, agency and customisation are elements of mobile learning that foster engagement and motivation.

This part has briefly considered elements of mobile learning. The next part looks at Aboriginal and Torres Strait Islander cultural philosophies.

3.5 Aboriginal and Torres Strait Islander cultural philosophies

The earlier diagram of the four theoretical domains is repeated (see Figure 3-11), with a highlight on the domain of “Cultural philosophies”. This section surveys perspectives about Aboriginal and Torres Strait Islander cultural philosophies in order to garner sensitising concepts that may assist in initial coding of data leading to the emergence of a Grounded Theory. Each of the three proceeding domains pointed to the issue of culture as being significant.

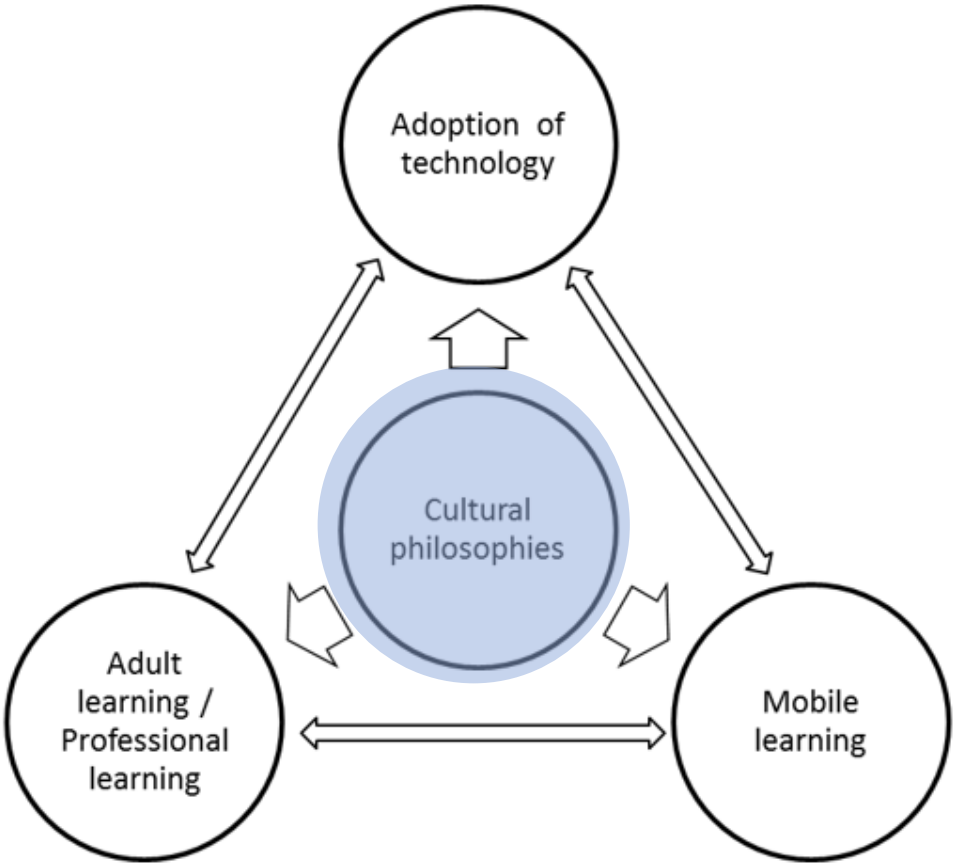

Figure 3-11 Aboriginal and Torres Strait Islander cultural philosophies as sources of sensitising concepts

Notions of culture based on national identity have been criticised (see 3.2.6). Thus in the context of this research with Australian Aboriginal and Torres Strait Islander peoples, it is important not to essentialise or posit a monocultural identity for all Aboriginal and Torres Strait Islander peoples, which ignores their diversities. It has been suggested that prior to the British colonial invasion of 1788 there were 700 language groups (Mooney, 2015). In the following quote, Moreton-Robinson (2011, p. 414) asserted the differences between First Nations: “‘Aboriginal’ signifies a

commonality of shared conditions of colonisation but cannot fully capture our respective ontological, epistemological, axiological and cultural subjectivities". The terms cosmology (perspectives of physical and spiritual realities), ontology (ideas of being and identity), epistemology (notions of knowledge) and axiology (beliefs of values and ethics) can be applied to any culture. These terms have been used by Aboriginal and Torres Strait Islander academics as philosophical frames of reference to discuss their positions in educational research. For the purposes of this research, the use of these philosophical perspectives enables the exploration of cultural elements that provide a rich understanding of the context of Aboriginal and Torres Strait Islander pre-service teachers' lives in very remote communities, including their tertiary study. Quotes from Aboriginal and Torres Strait Islander writers will be presented for each term in turn.

3.5.1 Cosmology

Arabena (2008, p. 1) suggested there is a common cosmological perspective among Indigenous philosophers globally: "the Universe is known as inherently dynamic, constantly changing in a process of renewal, and profoundly interrelated". In a similar way, Arbon (2008, p. 31) emphasised relatedness between ancestors, land, people and other entities:

> At places such as [name] … there is a relationship that exists with some of us as *Arabana*. Such places locate various activities of long ago when ancestors came from the land or sky to create all things including the form of the land. … These *wibma* [stories] also speak of other entities who share in this relatedness at particular locations.

There is an indissoluble bond and relationship between people and country: "We are living, breathing, thinking physical manifestation of our land – a thread in the pattern of creation" (Kwaymullina, 2008, p. 9).

3.5.2 Ontology

A feature of an Aboriginal and Torres Strait Islander sense of being is that it is framed within a collective or corporate understanding: "In honouring the integrity of the Universe as a whole interconnected life system, Indigenous peoples have learned to be in the world in reciprocal relationships with all things in the Universe, through cooperation, complementarities and interdependence" (Arabena, 2008, p. 1). Arbon (2008, p. 37) pointed out that for her people, the Arabana:

> The very core of what it is to be is an essence of origin – the *kurruna*– a primordial potency of energy which animates all entities. . . . From this beginning of *kurruna* tied with identity and consciousness, rises the fundamental ontologies of embodiment, reciprocity and relatedness.

Martin (2008, p. 69) expressed the same idea: "Throughout this account of Quandamoopah worldview [ontology], the essential feature of relatedness is constant".

3.5.3 Epistemology

Regarding knowledge, Nakata (2007, p. 185) stated, "Indigenous peoples hold collective rights and interests in their knowledge." Ford (2010, pp. 24-25) asserted the dynamic capacity of epistemology:

> Our knowledge system is rich in abstracted theoretical understandings centred on metaphorical ways of thinking and understanding the world. [These] come to inform new practices for us in contexts that involve us with other knowledge systems but which position us according to our own interests and ways of knowing, and our own understanding of who we are.

Arbon (2008, p. 48) indicated that "knowing is located, exists and has presence and is a component to our lived experience, engagement and interpretation in the world".

3.5.4 Axiology

In general, matters that are important and valued determine action. In discussing the cultural interface of Islander and scientific knowledge, Nakata (2010, p. 55) affirmed that "our storytelling teaches children that we know other things as well, that we do other things in particular ways for particular reasons." Martin (2008, p. 3) declared:

> Ways of Being require these Stories of relatedness to be respected by being responsible and accountable to your own Stories and the Stories of other Entities. Thus axiology is an integral and inbuilt feature of Aboriginal knowledges and these are not separate systems.

Arbon (2008, p. 53) asserted, "our Indigenous societies are very clearly founded within and on the symbolic, performative and interpretational, where dialogue, mentoring and responsibility are critical to doing".

In summary, this section has examined four aspects of Aboriginal and Torres Strait Islander cultural philosophies in order to identify sensitising concepts pertinent to this research about mobile devices for Aboriginal and Torres Strait Islander tertiary students in very remote communities. Notions of land, space, time, relatedness, collectivity, reciprocity, embodiment, engagement, understanding, responsibility, performativity, interpretation and accountability underlie Aboriginal and Torres Strait

Islander worldviews and are likely to shape attitudes towards and behaviours with mobile devices for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities.

3.6 Conclusion

This chapter covered five areas. It provided a justification of the use of an interpretivist paradigm and a phronetic approach to constructing Grounded Theory. The second section gave an overview of five theories about the adoption of technology and looked at the issue of culture; the third briefly looked at three perspectives of adult learning as well as considering current issues about quality in teacher education as an example of professional learning; the fourth examined notions of mobile learning with a focus on aspects of mobile learning design; and the fifth surveyed Aboriginal and Torres Strait Islander cultural philosophies. Given that constructivist Grounded Theory advocates becoming aware of general sensitising concepts, it was appropriate to consider each of these areas, as a preliminary to conducting this research. The following chapter takes a more detailed look at fields within the literature which intersect for the investigation of the use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers studying in very remote communities.

4 LITERATURE REVIEW

The previous chapter outlined a phronetic approach to constructing Grounded Theory. The aim of the thesis is to discover how the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. Four areas of theory were surveyed to provide sensitising concepts for the development of a Grounded Theory. These theoretical domains included adoption of technology, adult learning focused on professional learning, mobile learning and the area of Aboriginal and Torres Strait Islander cultural philosophies.

This chapter reviews literature in three fields of research: use of mobile devices, delivery of ITE, and Aboriginal and Torres Strait Islander people in remote communities. This enables a description of the current state of knowledge related to the research and identifies gaps in knowledge. Given the extensive literature related to each of the three fields, there is insufficient space in this thesis to do comprehensive reviews of each one. Instead, this thesis focuses on the literature pertaining to the intersecting sectors between these three fields, as presented in the diagram designed by the author (see Figure 4-1). This strategy enables the thesis to give attention to matters that are of particular relevance to the research. The literature review examines each of the intersecting sectors in turn, then synthesises the outcomes to build an integrated compilation of relevant research. In Figure 4-1 the numbered sections indicate specific elements of the literature, where numbers 1, 2 and 3 are the three fields. In order to avoid considering a vast amount of material, the literature review is confined to the intersecting sectors: 4, 5, 6 and 7 (which are highlighted). Each of these is described briefly below.

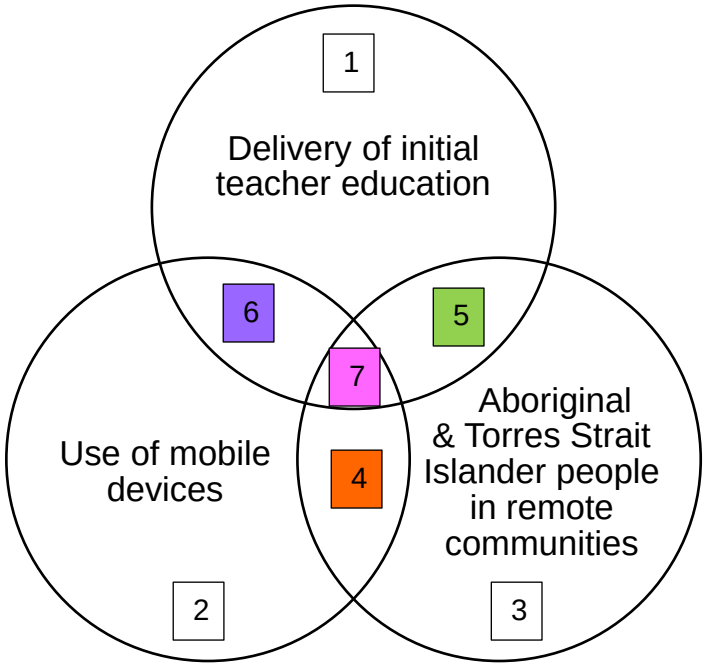

Figure 4-1 A concept map to scope the literature review

Sector 4 (highlighted in orange) examines the current use of mobile devices by Aboriginal and Torres Strait Islander people in remote communities. This establishes contemporary practice and identifies the skills possessed by many of the pre-service teachers who are the focus of the research. These existing practices and skills may be a foundation for using mobile devices to enhance their professional learning. This literature is discussed in section 4.1.

Sector 5 (highlighted in green) looks at the delivery of ITE for Aboriginal and Torres Strait Islander people in remote communities. This presents the current approaches being used by higher education institutions to offer ITE in these contexts. These systems are the context in which mobile devices could be used to enhance the professional learning for this cohort. This literature is discussed in section 4.2.

Sector 6 (highlighted in purple) considers the use of mobile devices within ITE. This explores the range of ways mobile devices are being used globally within the teacher education context. These strategies may suggest practices of mobile device use that could be incorporated into the Australian situation to enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers. This literature is discussed in section 4.3.

Sector 7 (highlighted in pink), scans the intersection of the three fields to see whether any literature addresses the use of mobile devices for ITE with Aboriginal

and Torres Strait Islander pre-service teachers in very remote communities. This literature is discussed in section 4.4.

To enable a clear focus on the matter of investigation, two boundaries were established in order to limit the literature. First, as English is the dominant language internationally, the national language of Australia and the language which is my mother tongue, only literature produced in English is examined. This strategy was not considered to limit the review, as it was expected that any literature about Aboriginal and Torres Strait Islander people generally, and their participation in ITE specifically would most likely be published in English. Second, the review is confined generally to material published in the past decade (i.e. from 2006 onwards), as this is the period in which mobile devices have become common; exceptions will be explained.

4.1 Sector 4 – Use of mobile devices by Aboriginal and Torres Strait Islander people in remote communities

This first section looks at the intersection of two fields: (1) use of mobile devices, and (2) Aboriginal and Torres Strait Islander people living in remote communities, as shown in Sector 4 (highlighted in orange), in Figure 4-2:

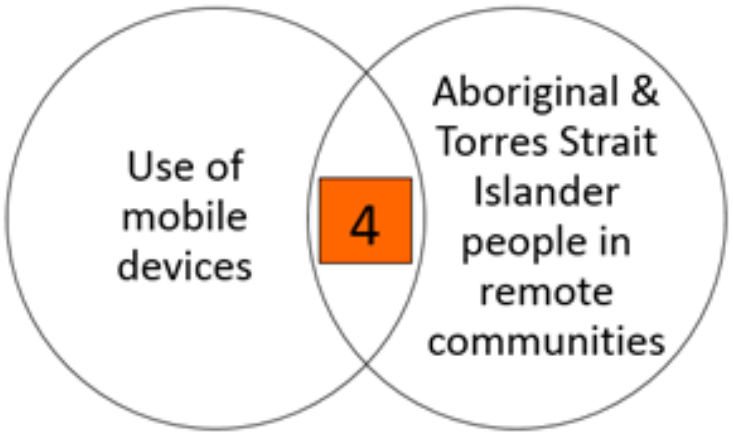

Figure 4-2 Literature about both the use of mobile devices and Aboriginal and Torres Strait Islander people living in remote communities

First, an overview of the context about ICT and telecommunication services covering the period 2008–2015 is presented.

4.1.1 Information and communications technology and telecommunication services in remote communities

Remote Aboriginal and Torres Strait Islander communities are generally

characterised by poor ICT and telecommunication services. Public telephones may not exist or not work, residential fixed-line telephone uptake is low, mobile phone coverage and wifi services may not exist, home broadband services are few and access to public internet is restricted. The situation was summarised in this way: "Indigenous Australians living in remote communities face distinct challenges in accessing and using basic telecommunications services" (Australian Communication and Media Authority, 2008, p. 5). In the same year, the Regional Telecommunications Review (the Glasson Report) stated that "mobile telephony and public phones (community and payphones) have greater relative importance than fixed voice telephony and broadband services in remote Indigenous communities" (Regional Telecommunications Independent Review Committee, 2008, p. 77). The National Broadband Network was announced by the Australian Government in 2009 with the aim to improve Australia's status as a digital economy. The initial idea was to connect 90 per cent of all premises with optical fibre (fibre-to-the-premises) and all other premises with wireless and satellite services (Department of Broadband, Communications and the Digital Economy, 2009, p. 9). In the body of the document there was little detail about remote Aboriginal and Torres Strait Islander communities.

In July 2010 a symposium was organised by AIATSIS titled *'Information Technology and Indigenous Communities'*, which issued a "Statement on Key Issues Identified". Support was requested for the

> generation of specific government policy and funding to ensure that high speed access to the internet and IT is provided to Indigenous Australians across the country (whether on outstations, in remote towns, regional areas or urban centres) both by increasing coverage for mobile telephones and landline cabling … [and] the inclusion of mobile telephony under the Universal Service Obligation to ensure affordable capped usage (Ormond-Parker, Corn, Obata, & O'Sullivan, 2013, p. xiii).

The next Regional Telecommunications Review (the Sinclair Report) stated that "a key concern for the committee is that Indigenous Australians may not benefit from the additional opportunities that high-speed broadband will provide, due to a number of barriers which impede access in regional and remote Indigenous communities" (Regional Telecommunications Independent Review Committee, 2012, p. 27). The Committee suggested there is "a need for a dedicated response to increase the rate of Indigenous engagement with telecommunications. The core issues identified by the committee in this regard are improving access to telecommunications services and increasing digital literacy" (p. 28).

Telstra is Australia's largest telecommunications company. In 2013, it commissioned

research on the engagement of Aboriginal and Torres Strait Islander people with the digital economy. In the foreword of a collection of essays based on the research, it was noted that “Indigenous people have really embraced digital technology; in particular in remote communities” (Telstra, 2014, p. viii). One essay pointed to an hierarchy of barriers that affect digital inclusion for Aboriginal and Torres Strait Islander people: infrastructure, hardware in the home, affordability, propensity and appropriate web-based services (Ganley, 2014, p. 20). The same author suggested that “in practical terms, addressing this ‘digital divide’ is about improving the opportunity to connect, providing a platform for innovation, and improving on the ground support” (p. 23). She also said that “mobile-based technology appears to be where the future is for remote Indigenous communities: community wifi, smartphones and tablets” (p. 15).

The most recent Regional Telecommunications Review (Regional Telecommunications Independent Review Committee, 2015, p. 26) stated that “for many remote communities, mobile technologies are the preferred mode of communication”. As evidence it cited the submission from the Northern Territory Government: “Smart phones and tablet devices are the product of choice in remote and particularly Indigenous communities. … Most [I]ndigenous communities have bypassed the personal computer and laptop in favour of smartphones and tablets” (Regional Telecommunications Independent Review Committee, 2015, p. 26). The Review pointed out that household satellite services in Aboriginal and Torres Strait Islander communities may be less appropriate than wifi services:

> … isolated Indigenous communities, many of which are within the satellite footprint, may be better suited to infrastructure that supports mobile connectivity or WiFi. … many Indigenous Australians have bypassed desktop computers, opting instead for portable devices and wireless connectivity. In such environments, a fixed satellite-based broadband service to every premises would be more expensive and less desirable than a WiFi hotspot (or array of hotspots) sharing a common satellite-based backhaul link (Regional Telecommunications Independent Review Committee, 2015, p. 34).

The following five sections consider issues about mobile phones, people’s contact networks, laptops and tablets, negative issues with mobile devices, and alignment with cultural ethos.

4.1.2 Mobile phones

4.1.2.1 Mobile phone adoption

There has been a rapid and extensive uptake of mobile phones in remote Aboriginal and Torres Strait Islander communities, including in communities without mobile phone coverage (Brady et al., 2008; Featherstone, 2011; Rennie, Crouch, Wright, &

Thomas, 2011). Once coverage is available, mobile phones are purchased quickly (Brady et al., 2008; Dyson & Brady, 2009; Kral, 2010; Singleton, 2013; A. Taylor, 2012b). Recent figures indicate that, Australia–wide, 70% of Aboriginal and Torres Strait Islander people surveyed own a smartphone, and 43% of Aboriginal and Torres Strait Islander people in remote communities own a smart phone (McNair Ingenuity Research, 2014). Other research has not distinguished the type of mobile phone, and so cannot be compared directly with the study by McNair Ingenuity Research. For these studies about Aboriginal and Torres Strait Islander people in remote areas, ownership rates of mobile phones vary, depending on the year in which the study was done and the length of time coverage had been present, ranging from 35% of people surveyed (Tangentyere Council & Central Land Council, 2007), 55% (Brady & Dyson, 2009), 58% (Dyson & Brady, 2009), 61% (Australian Bureau of Statistics, 2010) to 72% (Singleton, 2013). Over time the general rate of mobile phone ownership is increasing; so too the percentage of smart phone ownership is going up. Mobile phones are highly popular in remote communities among Aboriginal and Torres Strait Islander people and are used for various purposes.

4.1.2.2 Purposes for using mobile phones

The primary purpose for getting a mobile phone is for person-to-person communication with family, kin and friends. Six other key uses are (1) entertainment (Brady & Dyson, 2009; Dyson & Brady, 2009), including listening to music, watching movies, TV or sport and playing games; (2) creating multimedia products (Brady & Dyson, 2009; Kral, 2009, 2010, 2011, 2012, 2014; Kral & Schwab, 2012), such as photos, videos, oral recordings and music; (3) using other internet services (Brady & Dyson, 2009; Dyson & Brady, 2009; Kral, 2009, 2010, 2011, 2012, 2014; Kral & Schwab, 2012), ranging from online shopping and banking to downloading ringtones and wallpapers, looking for information and using maps; (4) emergency use (Australian Communication and Media Authority, 2008; Brady & Dyson, 2009; Tangentyere Council & Central Land Council, 2007); (5) work (Brady & Dyson, 2009; Dyson & Brady, 2009; Tangentyere Council & Central Land Council, 2007); and (6) study (Tangentyere Council & Central Land Council, 2007). In the early investigation from central Australia, it was proposed that “increasingly, mobile phones need to be considered an essential service” (Tangentyere Council & Central Land Council, 2007). A similar comment with regard to far north Queensland urged that “mobile phones should not be considered a luxury in remote areas and, furthermore, that this technology does *indeed* have the potential to enhance people’s lives socially, culturally and economically” [emphasis in original] (Brady &

Dyson, 2009, p. 41).

Singleton (2013) reported that it is common practice for local people in the Goldfields region of Western Australia to arrange their travel and camping itineraries in order to access mobile phone services from towers installed for mine sites: "Wongai's [sic Wongais] know you'll get a signal off a mine site, they'll set up camp in the bush nearby so people can still contact them, when they travel between towns. [They] used to follow water hole routes for travel, now they follow mobile signals" (p. 231) and "we go west towards the mine and get one there ... [it's] useful, yeah it's good. Get funeral details, talk to family without going all the way back [to Laverton, 150 km away]" (p.232). Aboriginal and Torres Strait Islander people in remote communities see mobile phones as a useful item in their everyday lives and are skilled users for a range of purposes and across various ways of using them.

4.1.2.3 Modes used with mobile phones

Communication is the primary use of a mobile phone, and this can be through several modes: talk (Brady & Dyson, 2009; Brady et al., 2008; G. M. Johnson, 2013; Tangentyere Council & Central Land Council, 2007), text – short messaging service (SMS) (Brady & Dyson, 2009; Singleton, 2013), multimedia messaging service (MMS) (Kral, 2010; Singleton, 2013), social media messaging (Kral, 2010; J. Lloyd, 2014; Vaarzon-Morel, 2014) or emails (Singleton, 2013). Texting occurs in both English and vernaculars, with creativity exhibited in abbreviation and invented spelling (Brady et al., 2008; Kral, 2009). As well, people are able to share content from one device to another wirelessly through Bluetooth (Brady & Dyson, 2009; Featherstone, 2011; Kral, 2010).

4.1.2.4 Types of users of mobile phones

Young people in remote Aboriginal and Torres Strait Islander communities are the main users of mobile phones. An early study reported usage at 93% of 15–17 year olds and 65% of 18–24 year olds (Tangentyere Council & Central Land Council, 2007); another study showed 80% of 16–34 year olds used mobile phones (Dyson & Brady, 2009). One study noted the young age profile of the Aboriginal and Torres Strait Islander population in remote communities and remarked they are "*growing up digital*" [emphasis in original] (Ormond-Parker & Sloggett, 2012, p. 204). According to Kral (2014) "communication via mobile phones and social networking has rapidly become the norm for Indigenous youth" (p.171). She also noted that "young women especially are typically in 'perpetual contact' … through Facebook on [i]nternet-enabled mobile phones" (p. 177). Young people have high ownership of mobile phones and are frequent users of them.

4.1.2.5 Frequency of use of mobile phones

Most owners of mobile phones have them with them constantly and use them in some way each day. Many people use mobile phones as storage devices, so every day they are looking at photos and videos and listening to music, as well as receiving phone calls and receiving and sending SMS texts (Brady & Dyson, 2009). Kral (2012, p. 273) pointed out that "digital technologies have become embedded in everyday social life for Ngaanyatjarra youth. They are now a normative aspect of communication, maintaining sociality, cultural production *and* learning" [emphasis in the original]. Vaarzon-Morel (2014, p. 9) suggested that "mobile phones extend Warlpiri persons and, through techniques of personalisation, are transformed into an inter-subjective phenomenon". She noted that "people keep their devices close to hand to play games, listen to music, take and view photos, and for safekeeping. Phones are stored in women's bras, handbags and pockets and are hung from cords around people's necks" (p. 9).

4.1.2.6 Cost management for mobile phones

Mobile phones are popular in remote Aboriginal and Torres Strait Islander communities and people have developed a range of strategies to minimise the costs incurred in using them. Brady and Dyson (2009, p. 30) identified seven ways people sought to manage costs, namely: (1) purchasing prepaid phones, (2) minimising usage, (3) minimising outgoing calls, (4) sharing a phone with a family member, (5) using text messages instead of phone calls, (6) using a "Pre-paid friends" service that allows unlimited calls and texts to five designated numbers for a set fee and (7) maintaining mobile phones as a personal device, that is, keeping it constantly in one's possession and not loaning it to others. A further strategy of using Skype (a free voice over internet protocol service) has also been observed (Corbett, Singleton, & Muir, 2009). Brady and Dyson (2009, p. 31) reported that some people had difficulties managing plans or contracts "and had incurred bills of up to $4,000". Figures from 2008 indicated 19% of Aboriginal and Torres Strait Islander people compared to 41% of non-Indigenous people had mobile phones on contracts (Australian Bureau of Statistics, 2010) – not using contracts was a strategy to avoid unexpected costs. A comment from Rigney (2013) summed up findings from most of the references cited so far: "mobile phones are the preferred telecommunications device used by the Indigenous communities and there is a strong preference for prepaid mobile services" (p. 29).

4.1.2.7 Benefits of using mobile phones

Despite the costs mentioned above, mobile phones are seen to benefit the users because they are portable and affordable multifunction tools that facilitate the uses

described earlier in section 4.1.2.2. For example, the Sinclair Report noted “a growing trend by Indigenous Australians in accessing the internet using mobile devices (more specifically mobile phones). Mobile devices are popular for a number of reasons including cost, prepaid options rather than postpaid, mobility across locations and transferability between people” (Regional Telecommunications Independent Review Committee, 2012, p. 29). Mobile phones are cheaper to purchase than laptops, tablets or personal computers and have no connection fees (such as are required with fixed-line broadband services for a home computer); phone calls can be private, as a person can move away from a public space; the device itself can be customised with ringtones, wallpapers and certain apps and thus becomes an individually owned item that does not have to be shared (Brady et al., 2008). Mobile phones provide instant communication that is generally not restricted by time or location, thus providing flexibility and freedom (Singleton, 2013). The combination of multimedia functionality and internet access on mobile phones (and other digital media) has led to new literacies, new representations of cultural heritage through cooperation between generations, global awareness and new forms of self-representation. Kral and Schwab (2012, p. 94) proposed that these lead to “the work-oriented habits and attitudes required to move towards responsible adult roles and to function as competent members of their own and other communities”. They suggested such learning “nurtures the development of enterprise, employment and leadership possibilities” (p. 96). Kral (2014, p. 16) reported:

> Through the artefacts of new media – laptops, digital cameras and mobile phones – many young people are embracing global digital youth culture and exploring the generativity of multimodal forms of communication, while simultaneously acting as agents for the recording and transmission of cultural memory in new forms.

Mobile phones are seen by Aboriginal and Torres Strait Islander people in remote communities as useful tools that enable them to perform a range of tasks and contribute to personal and community development. They are the dominant mobile device noted in the literature, with scant reference to laptops and tablets.

4.1.2.8 Reasons for not owning a mobile phone

A minority of people in remote communities do not own a mobile phone. As indicated in 4.1.2.1, mobile phone ownership (undifferentiated by type of mobile phone) in one group was around 72% (Singleton, 2013, p. 230), thus only about 28% of the people in that study did not own a mobile phone. The early report in central Australia (Tangentyere Council & Central Land Council, 2007, p. 33) noted that “the high cost of having a mobile phone or not having enough income were the

most common reasons given for not owning a mobile phone". If a person owns a mobile phone other people will request to use it, and thus the bill is increased to the owner. The report cites a person who had previously had a phone: "I don't have a mobile because I don't want the phone ringing all the time. Everyone uses my phone and makes the bill bigger for me" (p. 33). Other reasons included (1) preferring to use other phones, (2) using other people's mobile phones, (3) not liking mobile phones, (4) not knowing how to use a mobile phone, (5) not knowing how to obtain a mobile phone, (6) not having coverage in the home community, (7) not needing a mobile phone and (8) currently being without one because of losing one's own mobile phone. Some of these same reasons were reported by Brady and Dyson (2009). The cost of using a mobile phone is the most frequently cited reason not to own one.

4.1.3 People's contact networks

The main people contacted are family – children, spouses / partners, parents, grandparents, siblings, cousins, uncles and aunts. This can include those living in the same community and those in other communities or locations across Australia. Often, there is contact between parents and their children who have moved away from the home community for schooling, as well as others who have left for training or work (Brady & Dyson, 2009; G. M. Johnson, 2013). Kral (2011, p. 5) noted that Aboriginal and Torres Strait Islander young people in remote communities have "an ever-expanding network of kin, peers and non-Indigenous contacts through social media". Again in reference to young people, she and Schwab stated that young people are "skilled and clever participants in both the local and global world, enacting an expertise that is recognised both in their remote home communities and increasingly in the outside world" (Kral & Schwab, 2012, p. 51).

Middle-aged people also have contact details for a range of organisations and non-Indigenous contacts and friends (Vaarzon-Morel, 2014). Examples of this are medical and health trials which involved the use of mobile phones with patients or their parents / caregivers (Brusse, Gardner, McAullay, & Dowden, 2014; McCallum et al., 2014; Phillips et al., 2014, p. 364).

4.1.4 Laptops and tablets

Formal use of laptops and tablets through educational institutions and other organisations has been noted in the last few years. For example, some remote schools have received laptops from the One Child One Laptop philanthropic organisation (Dyson & Brady, 2013; Kutay & Mundine, 2013; A. Taylor, 2012a, 2012b). Charles Darwin University staff used laptops to enable elders in remote

Arnhem Land Aboriginal homeland centres to teach in the Yolŋu Studies program (Christie, Guyula, Gotha, & Gurruwiwi, 2010; Christie, Guyula, Gurruwiwi, & Greatorex, 2013; Christie & Verran, 2013). Laptops belonging to a cultural centre in Western Australia were used on a natural resources management field trip to edit video taken through the day (Singleton, 2013).

Little attention has been given to the informal use of laptops and tablets in remote Aboriginal and Torres Strait Islander communities, though this is increasing. One example described by Warren and Evitt (2010) mentioned hip hop artists using laptops in community media centres to record music. Featherstone (2011, p. 04.18) observed that "with the introduction of WiFi in Ng [Ngaanyatjarra] communities, there have been numerous reports of Yarnangu buying personal computers or laptops for use at home and connecting via WiFi with friends in other communities and outside the Lands using Facebook or email". Laptops are available in community stores and people use them to "play games, listening to music, doing all the stories on Facebook, doing it at home, connecting up to the WiFi. It's got Westpac and all. It's good to use on Christmas and holidays … when everything is closed" (Featherstone, 2013, p. 43). Kral pointed out that now control and access of mobile devices rest with the owners, rather than organisations or educational institutions (Kral, 2010, 2011; Kral & Schwab, 2012). She observed that "as access to telecommunications infrastructure and small mobile devices has improved, more individuated practices have emerged with people, predominantly young people, buying laptops, mobile phones and even iPads or Tablets" (Kral, 2014, pp. 6-7). She and Schwab also described a man in his fifties who had a laptop at home "for downloading photos, playing music [and] writing reports for his job" (Kral & Schwab, 2012, p. 64). According to A. Taylor (2012a) some people have highly developed skills: "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" (pp. 65-66).

Tablets (e.g. iPads) are barely discussed in the literature at all, apart from Kral's comment in 2014, mentioned in the previous paragraph. In the same article, she had a photo of someone using an iPad and a quote from a woman who said of the younger generation: "they got that iPod, iPad, computer" (p. 10). The only other reference is from Singleton (2013, p. 281), who suggested "the PC [personal computer] represents a gateway to the nexus of internet opportunities [through other devices] such as the iPad and other propriety brands".

To this point of the literature, review data has evidenced the popularity of mobile

phones and the beginning of interest in laptops and tablets. However, some people choose not to purchase such mobile devices.

4.1.5 Negative issues with mobile devices

Owners of mobile phones report problems with them, including social issues raised by the use of mobile phones. At a personal level, there is the matter of theft – a device can be stolen, which presents the owner with the financial cost of replacing it and the inconvenience of not having one in the meantime (Dyson & Brady, 2009, p. 172). Other people may borrow and use a mobile phone without asking – again, financial costs are incurred;if a mobile phone is left unattended, someone else might take out the battery and use it in their own phone, which means the owner can't use the device and will have to recharge the battery before being able to use it again (Brady & Dyson, 2009, p. 35). At a business level, companies lose productivity when employees use work computers to download music or videos for their mobile phones; the company also incurs the internet cost for these downloads (Brady & Dyson, 2009). At the social level, concern has been expressed about children accessing pornography (Brady & Dyson, 2009). Several studies reported on the issue of cyber bullying, teasing and gossiping (Brady & Dyson, 2009; Dyson & Brady, 2009). More specifically disrespectful interactions have happened through social media, such as Divas Chat and Facebook – including creating fake profiles using the names of dead people, swearing and threatening elders. One old woman suggested Divas Chat was "burning like a big bushfire" (Kral, 2014, p. 13). Vaarzon-Morel (2014, p. 14) described a sorcery-like use of mobile phones:

> Some young Warlpiri uploaded photographs of deceased relatives of members of the opposite faction and defaced them with vitriolic comments. Given that sorcery practices objectify the person and express non-relatedness … there are similarities between this act of defacing images and sorcery.

In these recent articles both Kral and Vaarzon-Morel noted how comments on social media have led to actual fighting between people. In discussing murders in communities, J. Lloyd (2014, p. 102) remarked that "new communication technologies and social networking via mobile telephones and smart phone applications are aggressively used by young women and men as a means to facilitate and incite personal and inter and intra family and community violence". Each of these last three authors highlighted the social disruption in communities, the violence and intergenerational tension that have been promoted through mobile phones.

Nevertheless, there is evidence that the popular uptake of mobile phones is

prompted by alignment with features of cultural ethos and that mobile devices may be used for positive cultural purposes.

4.1.6 Alignment with cultural ethos

Aboriginal and Torres Strait Islander people in remote communities are increasingly using mobile devices, particularly mobile phones. This contrasts with the decreasing use of fixed line home phones and desktop computers. If “technological artefacts are culturally constructed and interpreted” (Morsillo, 2008, p. 05.02), then the Standard Telephone Service in remote Aboriginal and Torres Strait Islander communities “shows strong evidence of a cultural misalignment between the technology artefact and the intended user” (p. 05.5), and home phones are an instance of “failure and resistance” (p. 05.3). Mobile phones and mobile devices, on the other hand, could be seen as examples of success and acceptance due to cultural alignment. Various authors point to congruence with aspects of culture, as facilitating adoption of mobile devices.

Brady, Dyson and Asela (2008) investigated the nexus between adoption of mobile phones and oral culture on an island in the Torres Strait. They applied the concept of “secondary orality” (Ong, 1982) to mobile phone calls and suggested that “the high rate of adoption is not unexpected in an Indigenous community where both the language tradition and the current language practice is oral” (Brady et al., 2008, pp. 393-394). The authors asserted that “two factors are probably necessary for technology adoption: (1) The technology must play to the inherent strengths of the culture, for example the oral tradition; *and* (2) The technology must evoke a high degree of motivation” [emphasis in original] (p. 394). In this case, “the use of mobile phones fit with the strong oral tradition of the Islanders” (p. 396).

Other examples of alignment with cultural ethos are given by various authors in the literature. For example, the use of icons as the access points for software on mobile devices appears to align with Aboriginal and Torres Strait Islander people’s familiarity with using visual and spatial cues in daily life (Kral, 2011). Mobile devices can be shared and people often show each other what they have on their screens – these “communities of practice” fit with existing learning styles of collaboration and cooperative learning (Kral & Schwab, 2012). Aboriginal and Torres Strait Islander people travel frequently (Dockery, 2014) and uses of mobile devices fit with and are modifying aspects of a mobile lifestyle, as described earlier by Singleton (2013) in relation to people travelling in proximity to mobile phone towers. Despite the diaspora of people away from their home communities, use of mobile devices reinforces links between people, and for those who are away it maintains their sense

of locality and belongingness (Brady et al., 2008). Given the low participation rates in formal education and employment in remote Aboriginal and Torres Strait Islander communities, the spontaneous use of mobile devices in sites away from designated centres of formal learning (e.g. schools or TAFE centres) and workplaces, embeds their ubiquity in the situated and authentic experiences of each day – in the affinity spaces of the store, health clinic or footy oval (Kral & Schwab, 2012). There are many accounts of the use of new media to facilitate intergenerational transfer of cultural knowledge (Kral, 2011; Ormond-Parker & Sloggett, 2012).

Aboriginal pedagogical systems and ICT pedagogical systems have been compared and overlapping commonalities observed. Donovan (2007, p. 99) designed a table with five paired features. He suggested that Aboriginal pedagogy is based on "learning through experiencing concepts", and this is similar to ICT pedagogy, which is based on "learning through experimentation". Further, Aboriginal pedagogy is built around peer or group learning, while ICTs allow groups to work together. He noted that Aboriginal pedagogy lets an individual conduct his or her own investigation, and that ICTs similarly allow a person to investigate a matter in his or her own time. He also indicated that Aboriginal pedagogies adapt to local contexts and ICTs allow for learning to be contextualised. He suggested that a local community has directive control over the learning practices of its members (such as in conducting ceremonies), and that ICTs allow for modification as the design of activities can be modified to suit specified outcomes.

According to G. M. Johnson and Oliver (2013, p. 4) there is a nexus between Aboriginal and Torres Strait Islander ways of learning, ways of life and uses of mobile devices. They believe there are "potential benefits of smartphones in terms of cognitive and literacy skills which impact on school achievement, employability and quality of life. There is reason to infer compatibility between Indigenous learning style and life circumstances and web-based mobile applications".

Yunkaporta (2009) presented an "8 ways" model of Aboriginal pedagogy, which contains the following elements: story sharing, community links, critical thought that deconstructs and reconstructs, non-linear dynamic thought, links to land, use of constructed symbols and images, use of non-verbal gestures, and creation of learning maps. Huijser and Bronnimann (2014, p. 106) suggest there are alignments between these and a range of social media tools and mobile device tools, such as discussion forums, chatrooms, Collaborate, MS Lync, Skype, YouTube, Vimeo, Facebook, Twitter and Flickr.

Guenther and McRae-Williams (2011, p. 92) suggest the analysis of alignment with ICTs can include cultural philosophies:

> It is possible to see a match between the ICT approaches (and teaching and learning processes more generally) used and elements of ontologies, epistemologies, axiologies and cosmologies. For example, if ICTs support what it means to be an Aboriginal or Torres Strait Islander in a remote community then it would appear that results are viewed positively by educators and community members alike.

There appear to be congruencies between cultural philosophies and the use of mobile devices. Thus, there is a possibility that cultural philosophies might promote the use of mobile devices for study purposes by Aboriginal and Torres Strait Islander preservice teachers in remote communities.

4.1.7 Summary

Based on the literature just reviewed, brief summary comments are now presented to identify existing practices and skills Aboriginal and Torres Strait Islander pre-service teachers use with mobile devices that could enhance their professional learning. The majority of Aboriginal and Torres Strait Islander people in remote communities are familiar with using mobile phones and, to a lesser extent, tablets and laptops. They are skilled in using talk, text and social media messaging in several languages. They are competent users of multimedia functions to capture, create and share new material, including photos, audio recordings and videos. They are able to handle complex financial tasks, such as online banking and online shopping, which require filling in forms. They are able to conduct extensive searches across the internet for material of interest. They enjoy the entertainment aspects, including playing games, listening to music and watching videos. All of these practices and skills could be transferred to the situation of being a tertiary student in terms of handling administration, obtaining content material, creating products for assessment individually and collaboratively and receiving and giving personal and academic support. The next part of the literature review considers the intersection of literature about Aboriginal and Torres Strait Islander people and ITE.

4.2 Sector 5 – Initial teacher education offered for Aboriginal and Torres Strait Islander people in remote communities

This section looks at the intersection of two fields: (1) Aboriginal and Torres Strait Islander people living in remote communities and (2) delivery of ITE, as shown in Sector 5 (highlighted in green) of Figure 4-3:

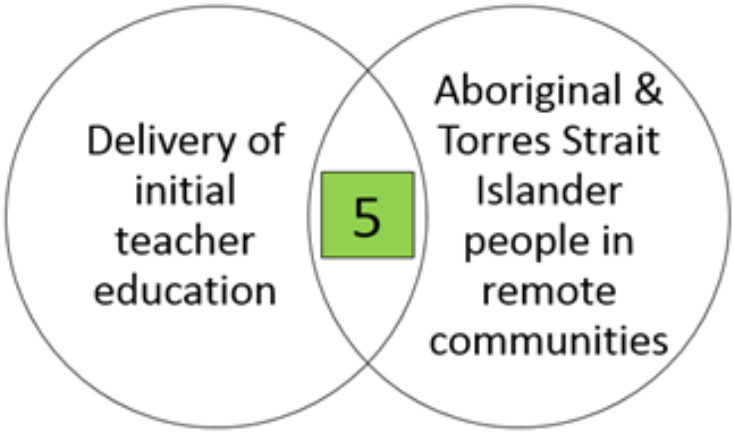

Figure 4-3 Literature about both the delivery of initial teacher education and Aboriginal and Torres Strait Islander people living in very remote communities

Chapter 1 raised the issue of low completion rates of Aboriginal and Torres Strait Islander tertiary students generally and specifically in two community-based ITE programs for Aboriginal and Torres Strait Islander people. Chapter 2 provided background about the lack of schooling workforce parity for Aboriginal and Torres Strait Islander teachers and leaders and gave details about the two community-based ITE programs that are the focus of this research (AnTEP and RATEP). That material is not reproduced here. This section has five parts which are surveyed to ascertain the extent of data on community-based ITE programs and the use of mobile devices in ITE: (1) policy statements from the 1970s onwards, (2) delivery modes of ITE programs, (3) the Aboriginal and Torres Strait Islander Education Action Plan 2010–2014, which governed national activities during the period of the PhD research, (4) the More Aboriginal and Torres Strait Islander Teachers Initiative, which also took place at the same time as the PhD research and (5) other recent reports and strategies. A summary is provided at the end of the section.

4.2.1 Policy assertions

A brief background has been given in sections 2.2.1and 2.3.1 about the antecedents of AnTEP and RATEP. In order to gain a broader national perspective of significant groups and policies concerning the training of Aboriginal and Torres Strait Islander people to become school teachers, further information is provided here about matters from the late 1970s onwards.

The 1979 National Inquiry into Teacher Education (NITE) looked at the needs for Aboriginal and Torres Strait Islander teachers. The National Aboriginal Education Committee made a submission noting that there were only 72 Aboriginal and Torres

Strait Islander teachers nationally and stressing that teacher training programs "should be structured to provide indigenous Australians upon completion with those qualifications that are recognised by all State Teacher Registration Authorities" (National Aboriginal Education Committee, 1979, p. viii). NITE led to government policy to use enclave or cohort systems of Aboriginal and Torres Strait Islander students only, to rapidly increase the number of trained Aboriginal and Torres Strait Islander teachers (Loos & Miller, 1989, pp. xiii-xiv). A few years later there was a call to rapidly increase the number of Aboriginal teachers (Hughes & Willmot, 1982). Subsequently, during the 1980s, there was "a large increase in the number of innovative and flexible programs set up across Australia to support Indigenous school staff to pursue teacher education pathways through to becoming qualified classroom teachers" (Hall, 2014b, p. 85). A decade after NITE, a joint policy from the state, territory and national governments in Australia was announced that identified long-term goals for Aboriginal and Torres Strait Islander education. One of these was the following: "To increase the number of Aboriginal people employed as educational administrators, teachers, curriculum advisers, teacher assistants, home-school liaison officers and other education workers, including community people engaged in teaching of Aboriginal culture, history and contemporary society, and Aboriginal languages" (Department for Employment, Education and Training, 1989, p. 1). Another decade later, another national group set out directions for Aboriginal and Torres Strait Islander education and included a recommendation "to include the engagement of students, their parents/caregivers and communities as a key objective and targets for the training and employment of Indigenous teachers" (Ministerial Council on Education, Employment, Training and Youth Affairs, 2006, p. 10). After two years another national policy included a stated aim to "increase Indigenous participation in the education workforce at all levels" (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008, p. 15).

This section briefly identified the issue of teacher training for Aboriginal and Torres Strait Islander people as a recurring policy theme over the past 35 years or so. This demonstrates that the aim of this research is apposite – to discover how the use of mobile devices could improve the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs.

4.2.2 Delivery modes of ITE programs in very remote communities

Aboriginal and Torres Strait Islander people can enrol in "mainstream" courses along with members of the general population, or they can participate in "cohort" programs which are "specifically offered to Aboriginal and Torres Strait Islander people" (Patton et al., 2012, p. 17). A variety of terms to describe modes of delivery

are used inconsistently in the literature. This section attempts to define them more precisely, and to give some examples that match the definitions here. This means some disagreements with previous authors' classifications. In the context of Aboriginal and Torres Strait Islander people living and studying in remote communities, all of these modes of delivery may broadly be termed mixed-mode delivery. Patton et al. (2012, p. 17) defined mixed-mode approaches as those that "allow students to do some of their course on campus and the rest away from campus". In contrast, Behrendt, Larkin, Griew and Kelly (2012, p. 80) defined mixed-mode more precisely as "a combination of distance education and intensive residential blocks or periods of face-to-face teaching". For the purpose of this thesis, the definition of Patton et al. will be used, as it covers the broadest range of modes of delivery. Four approaches are described: blended delivery, block delivery, reverse block delivery and community-based delivery.

4.2.2.1 Blended delivery

Blended delivery has been defined as including "traditional face-to-face teaching and online face-to-face teaching" (Behrendt et al., 2012, p. 184). This approach is common in urban and regional centres, where a person attends the university or study centre for face-to-face lectures and accesses online classes at various locations, such as the university, study centre, a place with internet access or at home. The swap between physical attendance and online participation may happen during the same day or several times during a week. This might be possible for Aboriginal and Torres Strait Islander people at some remote locations, for example, students in Certificates III and IV in Education Support in Broome could attend face-to-face lectures at the campus there of The University of Notre Dame (Australia) as well as accessing material online at sites of their choosing. Strictly speaking, students in these certificate courses are not part of an ITE degree, but are included here because they enable a pathway to enter such a course.

4.2.2.2 Block delivery

Willems (2012, p. 16) defined block delivery as "a form of mixed-mode tuition that couples residential on-campus intensives with lengthier off-campus periods". I suggest that the definition by Behrendt et al. (2012, p. 80), referred to above, fits block delivery, that is, "a combination of distance education and intensive residential blocks or periods of face-to-face teaching". Generally, the off-campus or distance components are done online. This is the most common form of study for Aboriginal and Torres Strait Islander people in remote or very remote communities. Patton et al. (2012, p. 18) pointed to this as an effective mode of tertiary study: "Block-release programs had between 16% and 20% higher course completion rates than those

who were studying in full-time ‘mainstream’ programs on campus”.

Batchelor Institute of Indigenous Tertiary Education (BIITE), and its antecedents, has been a key provider of Aboriginal teacher education in the Northern Territory for 40 years (Huijser, Ober, O’Sullivan, McRae-Williams, & Elvin, 2015). Reaburn, Bat and Kilgariff (2015) trace the history leading to the current partnership between BIITE and Charles Darwin University to form the Australian Centre for Indigenous Knowledges and Education (ACIKE). They state “The BIITE ACIKE teacher education program is a campus-based workshop model with students engaging in a blended learning approach with online learning supplemented by workshops” (Reaburn et al., 2015, p. 39). This fits the form of block delivery.

4.2.2.3 Reverse block delivery

According to Behrendt et al. (2012, p. 80), “‘reverse block release’ is a form of mixed-mode Away-from-Base delivery where a provider representative travels to students’ home community or communities to deliver on-site training”.

Growing Our Own was such an example. Although the program has ceased, it was a partnership between Charles Darwin University (CDU) and Catholic Education Northern Territory. Students remained in their own communities and had help from a mentor teacher and a school-based coordinator, as well as visits from lecturers from CDU (Growing Our Own, 2012). Giles (2010, p. 60) explained that the CDU lecturer “visits the site once a week (by plane) for the whole school year (typically 40 weeks) to deliver the academic course content, as well as to oversee the preservice teacher’s planning and to liaise with the school staff”.

The Indigenous Teacher Upgrade Program (ITUP), run through BIITE, was designed for Aboriginal teachers with a three-year qualification who wanted to upgrade to a four-year qualification. When explaining about the reverse-block release travel of lecturers, Hall (2014b, p. 91) stated: “in Central Australia the Teacher Lecturer travelled by car out to six communities to support up to eleven students while an Arnhem Teacher Lecturer based in Darwin travelled by air to eight communities to support up to 14 students”.

4.2.2.4 Community-based delivery

The tag “community-based” has been attached to various programs. It has meant that people are external or distance students of a university and live at home, or that students live in a location when they can do blended learning as defined above, or that students live at home and attend residential intensive courses through block delivery as defined above or that students live at home and university lecturers visit

their community or a nearby location.

None of these uses fits the definition provided in Chapter One (see section 1.4): *Another method of off-campus mode is community-based delivery, in which a support teacher lives in a community and provides daily assistance at a designated learning centre throughout the academic year.* The focus of this research is on two such community-based ITE programs, AnTEP and RATEP, for which the background was provided in Chapter 2.

This section has provided definitions and examples of four modes of ITE delivery that may be used by Aboriginal and Torres Strait Islander students in remote locations, noting that the literature may classify ITE programs differently. The following section considers a significant document that shaped activity regarding Aboriginal and Torres Strait Islander education over recent years.

4.2.3 *Aboriginal and Torres Strait Islander Education Action Plan 2010–2014*

The *Aboriginal and Torres Strait Islander Education Action Plan 2010–2014* (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010) has been the guiding document in recent years. The Plan covered six domains: (1) readiness for school, (2) engagement and connections, (3) attendance, (4) literacy and numeracy, (5) leadership, quality teaching and workforce development and (6) pathways to real post-school options. The fifth area has direct relevance to the matter of ITE graduates, as it includes the target "increase in the number of Aboriginal and Torres Strait Islander teachers, principals and education workers (Aboriginal and Islander Education Workers (AIEWs) and equivalents)" (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 23). This target was expressed as a specific action plan (#33) under national collaborative action:

> 33 MCEECDYA will develop a National Aboriginal and Torres Strait Islander Educator Workforce Strategy to assist education providers to make progress towards an equitable ratio of Aboriginal and Torres Strait Islander staff to students. The Strategy will support aspiring Aboriginal and Torres Strait Islander education leaders, include initiatives to attract more Aboriginal and Torres Strait Islander Australians into the education workforce and bureaucracies and provide pathways through the workforce. The Strategy will also help to recognise and clarify the role of Aboriginal and Torres Strait Islander education workers and support their professional development and career aspirations (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2010, p. 24).

The *Final Evaluation Report* of the Plan gave little information about the success of this action, apart from difficulties with data collection and a vague indication of

increase in numbers.

> There were significant differences in data collection methods between jurisdictions, limiting comparability. Some jurisdictions have not shared data for all sectors. Based on available data, the number of Aboriginal and Torres Strait Islander principals, teachers and AIEWs or equivalent has gradually increased over the past three years in many school sectors and jurisdictions (ACIL Allen Consulting, 2014a, p. 103).

However, close examination of the Report's data appendices reveals that 2011 data cannot be compared with 2012 and 2013 data. Thus the only measurable change is from 2012 to 2013. In this period across all sectors (Government, Catholic and Independent) the number of Aboriginal and Torres Strait Islander principals increased by 2.1 FTE; the number of teachers decreased by 48.9 FTE; and the number of AIEWs or equivalents increased by 84.9 FTE. In 2013 the FTE totals were: principals = 95.2, teachers = 2251.2, and AIEWs or equivalents = 2560.9 (ACIL Allen Consulting, 2014b, pp. 104-105).

4.2.4 More Aboriginal and Torres Strait Islander Teachers Initiative

As part of a range of activities under the *Aboriginal and Torres Strait Islander Education Action Plan 2010–2014* National collaborative action #33, the More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI) was established in mid-2011 as a four-year strategy. MATSITI aimed to improve the low numbers and retention rates of Aboriginal and Torres Strait Islander teachers in Australian schools. The objectives of MATSITI were to:

- identify the factors that contribute to the numbers of Aboriginal Torres Strait Islander people entering and remaining in teaching positions in Australian schools;
- identify the work currently being undertaken across all Australian jurisdictions to attract and retain Aboriginal and Torres Strait Islander teachers, and identify the gaps in that current work; and
- determine future priority initiatives that would help to deliver against the National Aboriginal and Torres Strait Islander Educator Workforce Strategy objectives in relation to teachers (Standing Council on School Education and Early Childhood, 2012, p. 54).

MATSITI and the Australian College of Deans of Education cooperated to commission research which produced the *Report into the retention and graduation of Aboriginal and Torres Strait Islander students enrolled in initial teacher education* (Patton et al., 2012). This commented on cohort programs, which are those "specifically offered to Aboriginal and Torres Strait Islander people" (Patton et al., 2012, p. 17). However, the report did not specifically address issues relating to AnTEP and RATEP, the two community-based ITE programs that are the subject of this research.

During the four-year period, MATSIS funded three projects which are pertinent to this PhD research involving mobile devices. Post-2012, MATSITI funded RATEP to expand off-site delivery to pre-service teachers (Halliday et al., 2015; MATSITI, 2014b). The evaluation final report of MATSITI noted that the RATEP off-site approach "incorporates interactive virtual classroom e-sessions, online assessment, course content and mobile technologies" (P. Johnson et al., 2016, p. 88). The off-site model was praised:

> It has harnessed appropriate technology and has ensured that well qualified staff were available to provide support for the students, having regard to the issues in offsite delivery and the remote living of many of the students. The program's low attrition rate is a testament to its success. … This project owes its success to its owners' awareness of and responses to difficulties faced by Aboriginal and Torres Strait Islander people in completing their studies, especially those living in remote locations. Responses include a sophisticated use of technology, involvement of Aboriginal and Torres Strait Islander people and ongoing support to students (p.89).

The positive evaluation of this off-site mode of delivery using mobile devices is of particular relevance to this PhD research, and supplements data collated from participants who were off-site students.

In the second project relevant to this research that was funded by MATSITI, a smart phone app and website were designed to promote pathways to teaching careers. The MATSITI Evaluation Panel found that "the project has harnessed technology which is vital for effective communication with young people and people in remote locations" (P. Johnson et al., 2016, p. 55). These comments positively link mobile devices and remote young people in relation to ITE and so support the aim of this PhD research.

The third project pertinent to this research that was funded by MATSITI detailed the impact of issuing tablets to nine pre-service teachers. The comments in the final report pre-empt some of the findings from this PhD research, which will be reported and discussed in later chapters. Extended comments are given here:

> The iPads were the foundation for building a professional learning community, and to enhance the capacity of the preservice teachers in their use in order to support their study and integrate their use in all aspects of learning and teaching. The iPads provided the preservice teachers with many opportunities to engage with university staff and develop their skills in reflection and critical thinking in a supportive online learning environment. It also strengthened the relationship between the students who shared their journey of online network-based learning. The preservice teachers used the iPads to help them develop their understanding of course content and pedagogy, to stay organised and stay connected to other students on a personal, social and professional level. The project also helped to make them job ready as teachers in a teaching and learning environment where technology is widely used and relied upon. Student feedback indicates that they learned a lot about accessing applications to make many aspects of their studies easier and be connected with other learners. They participated in forums and set up a private Facebook page (P. Johnson et al., 2016, p. 110).

The Evaluation Panel concluded: “This low cost project has provided preservice teachers with vital skills which will help them in their studies and their teaching careers. There would be value in ensuring that all preservice teachers had access to iPads (P. Johnson et al., 2016, p. 110). The strength of this final comment is highly significant at a national level.

The final report observed that while there was an increase of 16.5 percent of teachers who identified as Aboriginal and Torres Strait Islander between 2012 and 2015 (P. Johnson et al., 2016, p. 118), “whether this can be attributed to MATSITI is a moot point at this stage” (P. Johnson et al., 2016, p. 119). The final report suggested that MATSITI may have contributed to the increase in two ways: first by people entering the profession and taking up leadership roles “due to the strategies used by project partners and the work of MATSITI itself” and second, by the work of MATSITI and its project partners generating “an increased confidence in existing Aboriginal and Torres Strait Islander teachers that they may identify as such in a more culturally safe environment in schools and the broader education community” (P. Johnson et al., 2016, p. 123).

None of the final report’s 14 recommendations mention technology. This seems puzzling given the high estimation of the use of mobile devices in comments about the three projects above. Recommendation 9 calls for “a suite of strategies aimed at significantly increasing the completion rates of Aboriginal and Torres Strait Islander initial teacher education students be implemented by universities” (P. Johnson et al., 2016, p. 127). It offers some suggestions, but fails to repeat the link between mobile devices and low attrition rates made earlier in relation to the off-site delivery model. Recommendation 10 urges that “priority be given to establishing and promoting pathways for Aboriginal and Torres Strait Islander Education Workers to transition to careers as teachers and that such pathways be sensitive to the social, cultural and

financial support required for success". It notes:

> Many of these workers provide vital financial support to their families and play an important role in the life of their family and community. Dislocation from their family and community while studying is a critical issue. There are also employment issues relating to appropriate paid study leave and recognition of the additional load required when combining work and study. Flexible modes of study, flexible leave arrangements and financial support while studying would be of distinct benefit (P. Johnson et al., 2016, p. 128).

Given the evidence the Evaluation Panel already had to hand about dislocation from family and community, especially in remote locations, it is surprising that under "flexible modes of study" no mention was made of mobile device usage.

MATSITI occurred at the same time as the PhD research and I was privileged to attend three of the annual national conferences, thereby extending my network of stakeholders.

At the final conference a declaration was written (MATSITI, 2016) which summed up the work of MATSITI and pointed to the future. Called the Tarndanya Declaration, it stated: "Delegates seek recommitment of the Australian Education Council to a more equitable ratio of teachers to the Aboriginal and Torres Strait Islander students they teach, as agreed by all Australian Education Ministers in 2010" (MATSITI, 2016, p. 1). This statement refers to the problem underlying the PhD research. The Tarndanya Declaration included comments about the then recently released *National Aboriginal and Torres Strait Islander Education Strategy 2015* (Education Council, 2015) and asserted that the Strategy should focus on four matters, the second of which was "significantly increasing graduation rates of Aboriginal and Torres Strait Islander people participating in teacher education programs at Australian universities" (MATSITI, 2016, p. 2). This resolution aligns with the aim of the PhD research. The work of MATSITI and its project partners supported the focus of the PhD research.

4.2.5 Other recent reports and strategies

Four other documents are also of interest to this research. The *Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people* (Behrendt et al., 2012) similarly did not focus on community-based ITE programs. It did consider regional and remote delivery and pointed to blended delivery and reverse block delivery with the following general comments:

> Regional and remote Aboriginal and Torres Strait Islander students can be prevented from accessing higher education by geographical, academic, family and cultural factors. They have special logistical, academic and pastoral care requirements. Universities are finding ways to accommodate these needs to increase the participation and retention of students, through the application of new technologies, provision of decentralised student support and creation of defined pathways from regional VET programs (Behrendt et al., 2012, p. 184).

Critical success factors were that flexible delivery modes be accessible and that students' financial, personal and academic needs be supported. Key challenges included:

- ensuring that time and resources are made available to establish infrastructure in widespread locations
- accommodating the family responsibilities and limited capacity to travel of Aboriginal and Torres Strait Islander students
- gaining staff and student acceptance of technologies with which they are unfamiliar
- dealing with inadequate computer infrastructure, low levels of computer literacy and a lack of English language proficiency (Behrendt et al., 2012, p. 184).

These success factors point to the well-supported increased use of technologies, such as mobile devices, thereby lending support to this PhD research.

Two years later an investigation into transition to university study titled *Can't be what you can't see* identified 11 constraints and challenges faced by Aboriginal and Torres Strait Islander students. These included factors across three broad areas: related to schooling experiences, such as low ATAR scores; related to the higher education provider, such as lack of cultural competency among university staff members and difficulties with the Indigenous Tutorial Assistance Scheme – Tertiary Tuition; and related to the student, such as financial constraints, responsibilities to care for family members and obligations to attend mourning activities (Kinnane et al., 2014, pp. 51-69). The report also highlighted key elements of leading practice, including blended delivery for remote tertiary student access "through a mix of block release, reverse block release and online real-time delivery", while recognising limitations of internet access (pp. 114-116). The report did not deal specifically with ITE courses. However, the mention of online real-time delivery accords with the argument of this PhD research.

A recent report called *Action now: Classroom ready teachers* had little to say about training of Aboriginal and Torres Strait Islander teachers. Neither of the terms "Aboriginal" nor "Torres Strait Islander" were mentioned in the body of the

document. The word “Indigenous” was used three times in one paragraph when one example of reverse block delivery to Indigenous communities “supported by online course materials” in the Northern Territory was cited as an innovative approach (Teacher Education Ministerial Advisory Group, 2014, p. 49). There were no other references to ITE for Aboriginal and Torres Strait Islander people. Another section of the report indicated that:

> Delivery of initial teacher education could be enhanced through the use of technology. … Stakeholders reported that the use of digital technology to organise teaching resources and support learning experiences is common. … Some stakeholders suggested that online forums which enable rich discussion and reflection are particularly useful when they are implemented in ways that encourage all students to have a voice (Teacher Education Ministerial Advisory Group, 2014, p. 49).

However, the report failed to mention mobile technology or mobile devices. This seems a significant oversight given their general ubiquity globally and their common use in higher education.

The current main national document is the *National Aboriginal and Torres Strait Islander education strategy 2015*. It makes passing reference to Graduate Teacher Standards but has no discussion of teachers or ITE (Education Council, 2015, p. 7). No terms relating to technology are used: technology, laptop, tablet, mobile, phone, ICT, computer and device are all conspicuous by their absence. This strategy does not provide clear links to the PhD research. However, the priority on leadership, quality teaching and workforce development (Education Council, 2015, p. 4) allows scope for the focus of the PhD research on ITE (as indicated in MATSITI’s Tarndanya Declaration described in section 4.2.4).

4.2.6 Summary

Based on the literature just reviewed, brief summary comments are offered in order to position this research within the domain of ITE offered for Aboriginal and Torres Strait Islander people in remote communities. The need for more Aboriginal and Torres Strait Islander teachers and for more policies and strategies to that end has received attention since the mid-1970s. The focus of this research fits with that concern. A range of delivery modes were defined and examples given. This research specifically investigates two community-based ITE programs. The *Aboriginal and Torres Strait Islander Education Action Plan 2010–2014* had a target and specific action plan to increase numbers of Aboriginal and Torres Strait teachers, principals and education workers towards an equitable ratio of Aboriginal and Torres Strait Islander staff to students. This research aligns with those aims, inquiring how the use of mobile devices might enhance the professional learning of

students, which may serve to ameliorate the low completion rates of the two community-based ITE programs. Within the *Aboriginal and Torres Strait Islander Education Action Plan 2010–2014,* MATSITI collated data and funded research and projects. Very few of the projects focused on mobile devices; three were mentioned: the off-site approach within RATEP and the use of a smartphone app and tablets in two other projects. This research supports the aims of MATSITI and bolsters the sparse evidence about the use of mobile devices in ITE with Aboriginal and Torres Strait Islander pre-service teachers. Of other recent reports and strategies only the *Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people* mentioned the use of technology to any degree. It is a surprising omission in other documents. This research fills the gap in the literature by examining the use of mobile devices by Aboriginal and Torres Strait Islander people in community-based ITE programs.

The next part of the literature review considers the intersection of mobile learning and ITE.

4.3 Sector 6 – Mobile devices within initial teacher education

4.3.1 Background

This section looks at the intersection of two fields: (1) use of mobile devices and (2) delivery of ITE, as shown in Sector 6 (highlighted in purple) of Figure 4-4:

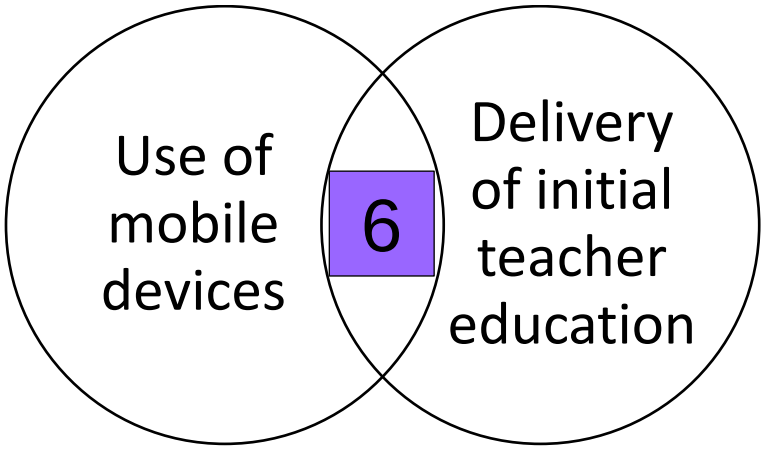

Figure 4-4 Literature about both the use of mobile devices and the delivery of initial teacher education

A range of international agencies and organisations note the broad impact of ICT

and endorse the potential of mobile technologies for education generally, for remote situations specifically, and for ITE and continuing professional development of teachers. The United Nations Educational, Scientific and Cultural Organization (UNESCO) advocated the use of mobile technologies for educational purposes: “Given the ubiquity and rapidly expanding functionality of mobile technologies, UNESCO is enthusiastic about their potential to improve and facilitate learning, particularly in communities where educational opportunities are scarce” (United Nations Educational, Scientific and Cultural Organization, 2012). In support of this, UNESCO produced a working paper series on mobile learning, which included 13 books. The two quotes below from the series focus on teacher education:

> There is a significant opportunity to more fully explore how mobile technology can support teachers and contribute to their training, motivation and retention within the teaching profession (Vosloo, 2012, p. 35).

> Mobile phones can be used to support classroom instruction, administrative communication and professional development for teachers (West, 2012, p. 8).

UNESCO (2013, pp. 31-32) recommended that educational policy makers at all levels world-wide “encourage teacher training institutes to incorporate mobile learning into their programmes and curricula” and “explore the practicability of providing professional development and teacher training via mobile technology”.

Teacher training models based on face-to-face approaches are now outmoded, as indicated in the following quote:

> In this fast changing world, different stakeholders will have to work together to develop new educational models to cater for new generations of learners who will be using mobile technologies that do not exist as yet. … Teacher training must be re-invented to prepare teachers for the technology-enhanced educational system (Ally & Prieto-Blázquez, 2014, p. 145).

Theories of learning and teaching have been examined and pedagogical benefits of mobile learning proposed, and there is a need for these to be incorporated into teacher education, as suggested here:

> Instruction on the pedagogical potential of mobile devices in learning must now become standard in the preparation of pre-service teachers, and the use of their own mobile devices in this preparation models good practice of their use in learning (Herrington, Ostashewski, Reid, & Flintoff, 2014, p. 137).

Similarly, the international Broadband Commission for Digital Development promoted the use of mobile devices for teacher education: “Mobiles offer a promising avenue to train new teachers, build their capacities, and support the work

of educators, both inside and outside classrooms" (2015, p. 52).

This first section provided evidence from international contexts that supports the use of mobile devices and mobile learning for ITE. According to Baran (2014, p. 17), prior to her review, "no systematic research has been conducted on mobile learning and teacher education. This is the first review to initiate an evidence-based discussion on mobile learning and related emerging pedagogical directions in teacher education". Hence it is apposite to devote attention to Baran's (2014) article in the following section.

Baran (now Baran-Jovanovic) is an assistant professor in the Department of Educational Sciences at the Middle East Technical University, in Ankara, Turkey. Her research focuses on technology and teacher education and mobile learning in teacher education. In 2015 she received the 'Technology as an Agent for Change in Teaching and Learning' early career award from the American Educational Research Association. She is the International Coordinator for a five-year project (2013–2017) called 'Integrating Mobile Applications into Teacher Education', funded under The EU Frameworks Programs Career Integration Grants (PEOPLE - Marie Curie etc.) and Infrastructure Development Program (CAPACITIES).

Baran (2014) synthesised global research between 2000 and mid-2014 on mobile learning in teacher education contexts, with four inclusion criteria:

> (a) empirical research on mobile learning in preservice and in-service teacher education contexts across different disciplines …; (b) applications of mobile technologies (e.g., mobile phones, smartphones, tablets) in a teacher education context; (c) in-service teacher, preservice teacher, or teacher educator participants; and (d) publication in a peer-reviewed journal, … Studies on preservice and in-service teachers' perceptions of mobile learning were also included (Baran, 2014, pp. 18-19).

Six main findings emerged: (1) there is an increasing trend to integrate mobile learning in teacher education, (2) theoretical and conceptual perspectives are rarely reported, (3) perceptions, attitudes and usage patterns vary, (4) use of mobile devices and mobile learning is seen as beneficial, (5) drawbacks and difficulties were not often mentioned and (6) many pedagogical advantages were noted for using mobile learning in teacher education (Baran, 2014, pp. 21-28).

4.3.1.1 Trends in the mobile learning and teacher education literature

Most of the articles in Baran's review were published in 2013 and 2014. This shows recent increased interest in the integration of mobile learning in teacher education. Around 38% of the studies listed were conducted in the USA, and the rest were from

a range of other nations. Most were case studies or used mixed methods. The majority (21 of 37) focused on pre-service teacher education, and most covered more than one subject domain. There were two main types of articles: implementation studies (25 of 37) and surveys (12 of 37). About half (17 of 37) reported assessment of their measures. Mobile phones were the most common device used in teacher education contexts (43%), then tablets (18%) and laptops (13%).

4.3.1.2 Scant report of theoretical and conceptual perspectives

Very little has been published that integrates theoretical perspectives into research about mobile learning in teacher education. In this area Kearney appears to be the key theorist. He devised a pedagogical framework, identifying three features of mobile learning: authenticity, collaboration and personalisation (Kearney et al., 2012; Schuck, Aubusson, Kearney, & Burden, 2013) (see section 3.4.2). Other theoretical perspectives noted by Baran (2014, p. 23) included experiential self-regulated learning (Järvelä, Näykki, Laru, & Luokkanen, 2007), cognitive development theory (McCaughtry & Dillon, 2008) and motivation theory (Ciampa, 2014). This area is under-theorised, and future authors could begin by interrogating Kearney's ideas.

4.3.1.3 Varied perceptions, attitudes and usage patterns

There were varied results from surveys with both pre-service and in-service teachers about mobile learning. This variability arises from the diverse settings of the studies in relation to "the availability and accessibility of technologies, resources, country infrastructure, and motivation of teacher education programs" (Baran, 2014, p. 23). More and more pre-service teachers were accessing resources on mobile devices (Hossain & Quinn, 2013; Shotsberger, 2002). Baran (2014, pp. 23-24) reports that research shows that if pre-service teachers are given the opportunity to use mobile devices in both their own learning and in classroom internships, then their perceptions of the benefits of using mobile devices become more positive (Gado, Ferguson, & van 't Hooft, 2006; McCaughtry & Dillon, 2008). Only a few studies reported information about pilot trials of instruments used in surveys. This makes it difficult to compare results with respect to validity and reliability issues (Baran, 2014, p. 24). As the ubiquity of mobile devices increases and both pre-service and in-service teachers' skills in using mobile devices for their personal lives improves, then it is likely their attitudes towards using these in teacher education contexts will become more favourable. So too, this trend is likely to be duplicated with regard to faculty in higher education institutions implementing mobile learning in courses.

4.3.1.4 Mobile learning is reported as mainly beneficial

Baran stated that the research suggests several motivating factors for incorporating mobile learning into pre-service teacher education, such as staff modelling mobile pedagogies and fostering communities of learning and collaborative knowledge construction. She also reported that using mobile devices helped pre-service teachers develop new literacies, explore subject areas in the real world and foster personalised learning. Resources can be accessed as needed, experiences can be captured and shared and new knowledge constructed (2014, pp. 24-25).

4.3.1.5 Scant report of challenges

Most of the studies emphasised the benefits of using mobile learning in teacher education, but did not discuss the difficulties in detail. Baran stated that several challenges were reported "including ethical issues, lack of support, accessibility and technical limitations, insufficient experience, mobile phone bans in schools, and curriculum adaptations" (2014, p. 25).

4.3.1.6 Mobile learning practices within teacher education contexts

Studies in Baran's review included three groups: pre-service teachers, in-service teachers and teacher educators. I will summarise her findings for the first group, as pre-service teachers are the focus of my thesis. She identified the pedagogical advantages of mobile learning in pre-service teacher education: "connectivity and collaboration, flipped classroom models, mobility within the physical space of the classroom, backchannel conversations, engaging with content on mobile devices, mobile learning in student teaching, performance evaluation, and participation in PLCs [professional learning communities]" (2014, p. 26).

4.3.2 Summary

Based on the literature just reviewed, brief summary comments are offered in order to position this research within the intersection of material about the use of mobile devices in ITE. International groups and experts advocate for the use of mobile devices in higher education and ITE. This PhD research accords with this endorsement of international authorities. One researcher compiled six main findings from a review of literature published between 2000 and mid-2014. This PhD research illuminates each of these six areas and presents details specific to the context of the use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers studying through community-based ITE programs in very remote communities.

4.4 Sector 7 – Mobile devices in initial teacher education for Aboriginal and Torres Strait Islander people in very remote communities

This section looks at the intersection of three fields: (1) delivery of ITE, (2) use of mobile devices, and (3) Aboriginal and Torres Strait Islander people living in very remote communities, as shown in Sector 7 (highlighted in pink), of Figure 4-5:

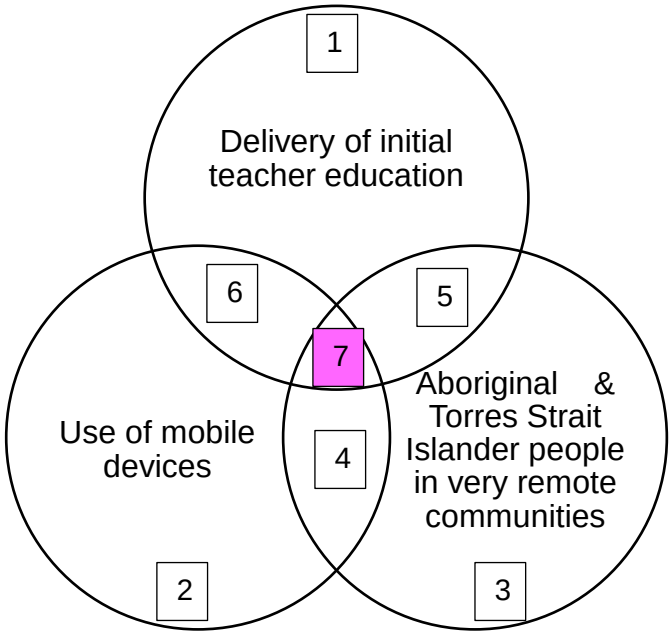

Figure 4-5 Literature encompassing the use of mobile devices in the delivery of initial teacher education for Aboriginal and Torres Strait Islander people living in very remote communities

Sector 7 is the focus of the research. For this review, publications on the two community-based ITE programs AnTEP and RATEP were excluded in order to identify the extent of other literature concentrating on the intersection of these three fields. There is a paucity of such literature: only one other ITE institution has published material, that is, Batchelor Institute of Indigenous Tertiary Education (BIITE).

4.4.1 Batchelor Institute of Indigenous Tertiary Education

4.4.1.1 Indigenous Teacher Upgrade Program (ITUP)

ITUP was mentioned earlier (section 4.2.2.3). In this program, structural support was important to enable people to complete the program within the two-year time frame: “These were things like having a dedicated study space and having access to technology such as a portable computer and the internet” (Hall, 2014b, p. 93). The article does not specify what is meant by a “portable computer”; however, it is

portrayed as a mobile device.

4.4.1.2 Preparation for Tertiary Success

Though the Preparation for Tertiary Success (PTS) course is not an ITE degree, information about it is included here, as the cohort is similar to people who potentially could enrol in an ITE course. PTS is a tertiary enabling program run by BIITE in a block-release delivery mode. Staff set up a closed or "secret" Facebook Group for participants, which was highly popular. They explained the benefits of social media and mobile devices:

> In addition, students report numerous practical advantages of being able to communicate with staff via Facebook on their mobile phones. Some students do not have regular access to computers or internet other than as part of their mobile phone plan. Even students with their own computer often have expensive or unreliable internet access. Access to Facebook through their mobile phone keeps the lines of communication with lecturers open and students are submitting their assignments before the due date, which coincides with improved retention and graduation rates (Hall & Maughan, 2015, p. 58).

The quote above provides clear evidence of the positive links between mobile devices and retention and graduation rates. Moreover, the authors concluded their article by asserting that "the use of Facebook in the PTS course is enhancing the learning experience of the students" (Hall & Maughan, 2015, p. 59). This aligns with the aim of this research to investigate how the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs while living in very remote communities.

Having seen the use of Facebook in the PTS, two other BIITE staff advocated the use of social media through mobile devices to foster relationships, as this fits with an ethos of learner-centredness:

> We would argue that social media, in combination with mobile technologies, indeed have the potential to upset the *status quo* and create a situation where relationship building can take centre stage on an ongoing basis. Ultimately, this would then lead to much more learner-centred approaches with the power to match the rhetoric, and it would apply to all levels of tertiary education, including postgraduate education (Huijser & Bronnimann, 2014, p. 104).

4.4.2 Summary

This section looked at literature at the intersection of the three fields and identified the dearth of material. There is a gap in the literature which this research fills, as it provides evidence of how Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs use mobile devices and how they perceive that mobile devices might enhance their professional learning while living in very remote

communities.

4.5 Conclusion

This chapter examined four intersection points between three fields, which revealed a number of features of the current situation with regards to use of mobile devices in the delivery of ITE for Aboriginal and Torres Strait Islander people in remote communities. From Sector 4 it is clear that mobile devices are highly popular among Aboriginal and Torres Strait Islander people in very remote communities. People are skilled at using mobile devices in a variety of ways, thus there is a foundation on which to build for the use of mobile devices in tertiary study. Sector 5 indicated that across the various modes of delivery of ITE to Aboriginal and Torres Strait Islander people in very remote communities, a common feature is the increasing use of online practices. Where mobile coverage and internet access exist, students are keen to participate this way. Sector 6 demonstrated positive evaluations and pedagogical benefits of the use of mobile devices by stakeholders in ITE. Sector 7 revealed the almost complete absence of material about the use of mobile devices in ITE programs for Aboriginal and Torres Strait Islander people in very remote communities.

When these aspects are viewed in the light of factors discussed in the previous chapter, then a number of potential areas of investigation arise. One area that could be explored is that of Aboriginal and Torres Strait Islander philosophies – such as cosmology, ontology, epistemology and axiology – and how these might fit with the theoretical pedagogic framework of mobile learning presented by Kearney et al (2012). There is potentially also an opportunity to incorporate aspects of adult learning theories, such as andragogy, with elements of Aboriginal and Torres Strait Islander learning styles. This may serve to explicate the motivation for the uptake or adoption of mobile devices by Aboriginal and Torres Strait Islander people generally. It may highlight potential uses of mobile devices for facets of ITE, including administration, obtaining content material, creating products for assessment and sharing personal and academic support. Furthermore, the interplay of study and the context of the lives of Aboriginal and Torres Strait Islander pre-service teachers in remote communities could be explored, noting their personal issues, family responsibilities and cultural obligations. I considered that these areas were matters that I should investigate in my research, and so I should take them into account when selecting a research methodology. The following chapter considers an appropriate research methodology, given the background of the researcher, the proposed participants, and their contexts.

5 METHODOLOGY

The previous chapter reviewed literature at the intersections of three fields of inquiry: use of mobile devices, delivery of ITE and Aboriginal and Torres Strait Islander people in remote communities. This was done in order to gain a broad perspective in framing the research, which aims to discover the beliefs and behaviours about the use of mobile devices in tertiary study of Aboriginal and Torres Strait Islander pre-service teachers who live in very remote communities. In the light of that review, and with recognition of relevant areas of theory raised in Chapter Three (including adoption of technology, adult learning / professional learning, mobile learning and Aboriginal and Torres Strait Islander cultural philosophies), the following questions guided this research:

1. What elements of content material, administrative support, and personal encouragement for their ITE training do Aboriginal and Torres Strait Islander people in very remote communities use or want to see provided by mobile technologies?
2. In what ways are andragogical methods affected by the use of mobile technologies in the delivery of ITE to Aboriginal and Torres Strait Islander people in very remote communities?
3. In what ways do Aboriginal and Torres Strait Islander people in very remote communities think the use of mobile technologies could affect their rate of progress towards completion of an ITE qualification?
4. How do features of mobile learning align with Aboriginal and Torres Strait Islander cosmology, ontology, epistemology and axiology?

Using a four-part structure, this chapter sets out the manner in which these research questions were addressed. The first outlines the scope and design of the research. The remaining three parts are based on Martin's "relatedness theory" (Martin, 2003, 2008). Part Two is titled "Being" and describes how I came to the research, ethics and the process of building relationships. The next part is titled "Doing" and describes the participants and the data collection process. The final part is titled "Knowing" and looks at data analysis. At times throughout this chapter, in describing aspects of the methodological process, I use a modified form of storywork or storying or yarning. Martin (2008, p. 95) defined storywork "as a culturally relevant and respectful set of processes for sharing experiences, meaning making and learning" and a strategy that emphasises "the maintenance of relatedness". The incorporation of a modified form of yarning into this chapter is an example of

"interfacing" research methods, as explained by Leeson, Smith and Rynne (2016, p. 2) when describing their work:

> This article advocates *interfacing* as opposed to *integrating* two discrete modes of research: yarning and appreciative inquiry … in order to exemplify a way in which academic and cultural reciprocity may occur regarding First Peoples and non–First Peoples research methods [emphasis in original].

Geia, Hayes and Usher (2013, p. 15) stressed that yarning is a way to build a relationship: "Yarning … is an informal and relaxed discussion; a journey both the researcher and the participant share as they build a relationship and visit topics of interest to the research". I have four intentions in telling my yarns: to emphasise my relatedness to the stakeholders and participants, to make meaning of the research process, to embody a degree of reciprocity in the design of the thesis and to invite the reader into a relationship with me, in order to understand my phronetic approach in both conducting the research and in writing it up. This will enable the reader to "get inside" the research process and join me as I came amongst and came alongside the research participants. In so doing, the reader will gain deeper insights into the significance of my decisions for the fulfilment of my purpose to explore the perceptions and practices of Aboriginal and Torres Strait Islander pre-service teachers about the use of mobile devices in their tertiary study while living in remote communities.

5.1 Scope and design

As indicated in Chapter 1 (1.2), the focus of this research is on Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs. Thus other ITE programs are excluded. Only two programs met the criteria of having residential support teachers and learning centres in communities: AnTEP and RATEP (section 1.4). No research with Aboriginal and Torres Strait Islander participants from both these community-based ITE programs had been done previously. This research fills that gap in the literature.

In discussion with stakeholders, and given the aim of the research, it was deemed appropriate to integrate both qualitative and quantitative data to create a holistic picture. Hence, a mixed methods approach was planned. Several characteristics of this approach have been described in two key sources (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2010). Characteristics of a mixed methods approach reported in both sources are repeated here: it embraces diversity in types of data, so it uses both quantitative and qualitative data; it collects data in multiple phases, and these can be iterative and cyclical investigations; and the nature of the problem

determines the design utilised. Several reasons for using a mixed methods approach for this PhD research are pertinent: a more complete account could be generated; findings on one hand could be further explained by reference to the other, thus enhancing credibility; the life situations of remote communities could lead to complex findings; and an understanding of the rich meanings embedded in these findings would be most likely through a holistic approach. An exploratory sequential design was to be used with qualitative data collected first followed by quantitative information (Figure 5-1). This process was chosen to enable me to explore aspects of an emergent theory based on qualitative data (Creswell & Plano Clark, 2011, pp. 86-90; Teddlie & Tashakkori, 2009, pp. 153-155).

Figure 5-1 An exploratory sequential design in a mixed methods approach

Source: Creswell and Plano Clark (2011, p. 69)

However, this process did not occur as planned. Following collection of qualitative data through interviews conducted during field trips in late 2013 and early 2014, I spent several months preparing transcripts, coding data and identifying categories. This enabled me to identify elements which I wished to pursue and aspects that were missing with regard to demographic information. Accordingly, I designed an online survey to collect quantitative data (see 9.8 Appendix H). In November 2014 a link to this online survey was emailed to support teachers and school principals in RATEP and AnTEP. This was followed up by telephone calls a week later. There were 12 responses by the end of 2014, all from RATEP respondents. In February 2015 I telephoned schools and sent emails again. There were no further online responses. One site in South Australia requested a printable copy, and four hard copies were posted back to me. In total, 16 surveys were completed. This is far less than the target of 120 surveys.

The low number of completed surveys is due to two factors: (1) inability of Queensland recipients to access the online survey, and (2) inconvenient timing at the end of the academic year. With regard to the first point, a link to the survey was emailed to Queensland support teachers on 11 November 2014. However, due to the international G20 meeting in Brisbane held 15-16 November, advanced security

restrictions on using the internet through Education Queensland prevented RATEP participants from accessing the survey (J. Sterling, personal communication, November 18, 2013). In reference to the second point, notification of the link to the survey happened near the end of the academic year for both schools and the community-based ITE programs. It arrived at a time when people were busy with exams, assignments and pressure at the work place. Queensland RATEP students were also preparing to leave communities and attend an end-of-year residential course. It is likely that in November people had higher priorities than completing the survey, and after that, they may have forgotten about it. The small number of completed surveys is insufficient for the large-scale statistical analysis that was planned. Most of the questions in the online survey were different to those asked in the face-to-face interviews. Hence, not much data from the online survey can be incorporated into the findings. Responses from the 12 Queensland RATEP students is included in Chapter 6 with findings for Research Question 1 at 6.1.1.1.3. No data from the four South Australian respondents is included at that point because none of them were AnTEP students. No other quantitative data from the online survey is included in this thesis. Thus, the Mixed Methods design was restricted.

The next part of the chapter focuses on one aspect of Martin's "relatedness theory" that is, "Being" (Martin, 2003, 2008). This was done to highlight my role as the researcher and how I approached the ethical and relational aspects of that role.

5.2 Being

Martin (2003, p. 206) described a sense of being as relational ontology: "It is through ontology that we develop an awareness and sense of self, of belonging and for coming to know our responsibilities and ways to relate to self and others". This part of the chapter has four sections, considering first reflexivity, then a yarn about how I came to the research, followed by recognition of ethical sensitivities and concluding with a yarn about how I built relationships with stakeholders.

5.2.1 Reflexivity

As described by Nakata (2014, p. iv), I am one of "those who occupy the vexed position of White researchers committed to undertaking ethical research in Indigenous contexts". In conducting my research, I was mindful both of what earlier and current non-Indigenous researchers had done or were doing and how that had been and was being viewed by the Aboriginal and Torres Strait Islander participants themselves and other Aboriginal and Torres Strait Islander people who observed and were observing what happened. Of particular relevance to my research was the

negative impact of a project linked to the Australian National University and the National Museum of Australia called “Songlines of the Western Desert”. This project included non-Anangu who had many years of relationships with Anangu. Soon after I enrolled in the PhD, in April and May 2012 the project was severely criticised by the custodian of the land where one story originates. According to a newspaper article, the custodian said, “Saying they want to preserve our culture is rubbish. Exposing the most sacred of Aboriginal men's law to unready women and children, let alone the entire world, will further weaken our culture and humiliate traditional Anangu [sic Anangu] men” (Rintoul, 2012). This coincided with my first visit to the APY Lands to meet the Pitjantjatjara Yankunytjatjara Education Committee (PYEC) to discuss my research. I believe that the angst generated by this controversy was a factor in the length of time it took for me to receive endorsement from the PYEC, which did not happen until July 2013. Disputes about the Songlines project continued for the next few years, as described in another newspaper article:

> The Pitjantjatjara desert people of the state’s north are in extreme tension, divided, full of anguish. … No collision in recent decades between the grand designs of the mainstream world and an Aboriginal resistance campaign quite rivals this one for its long-term impact (Rothwell, 2014).

At the same time as one of my field trips to the APY Lands, there was a major disagreement between Anangu about an exhibition based on the Songlines project at the South Australian Museum, which led to action by the Supreme Court of South Australia, which “granted two temporary injunctions after a group of senior traditional men from the Anangu [sic Anangu] Pitjantjatjara Yankunytjatjara (APY) lands, in far north South Australia, took civil action against some of the content in the Ngintaka [sic Ngintaka] Songline exhibition” (Brooks, 2014). The timing of my research was not auspicious, as it ran parallel to the umbrage caused by the Songlines project over several years (Songlines of the Western Desert Project, 2015). In this context of suspicion and antipathy towards research, it behoved me to be especially transparent in every aspect of the research. Though written after these events in 2012, the caution by Hall (2014c, p. 2) is appropriate: “No researcher can plan to do research involving Indigenous communities without first examining the post-colonial research reality that has been brought about by a history of research that has so often damaged, disempowered and silenced Indigenous peoples”.

In order not to further contribute to the colonising tendencies of mainstream Western research (L. T. Smith, 2012), I needed to be able to answer the question “Who am I to be doing this research?” That required me to ask questions of myself. Rix, Barclay and Wilson (2014, p. 3) suggested that “in essence, reflexivity challenges us

to understand who we are and what we bring to the creation of new knowledge, and how as researchers we shape and influence research findings". Similarly, Nilson (2016, p. 1) argued for "the importance of researcher reflexivity for non-Indigenous researchers undertaking or considering engagement in an Indigenous arena". From one perspective, this work of reflexivity is an interior and subjective activity. However, it also requires recognition of the self with regard to others. Milner (2007, p. 388) argued that it is "necessary for researchers to consider dangers seen, unseen, and unforeseen in conducting research". Furthermore, he challenged researchers "to reconsider their own and others' racialized and cultural positionality in conducting research" (Milner, 2007, p. 397).

As indicated in section 3.5.2, Aboriginal and Torres Strait Islander writers, along with Indigenous authors globally, aver what Martin (2008, p. 80) terms "the ontological premise of relatedness" (Arbon, 2008; Chilisa, 2012; Ford, 2010; L. T. Smith, 2012). Hence in exploring my own sense of self and in approaching the research, primacy was given to the place of relationships. Building on what I have presented above, the next section is a yarn of how I came to be a researcher and the importance of relationships in forming this identity and shaping the research.

5.2.2 Approaching the research

In considering doctoral study relating to education and remote Aboriginal and Torres Strait Islander people, several areas of my life coalesced to generate an idea:

- Every day over 27 years in my cross-cultural education career, I worked alongside Indigenous colleagues in both Australia and Papua New Guinea and assisted them with their professional development as teachers.
- I was in the APY Lands when AnTEP started.
- I saw the rapid uptake of mobile devices in remote locations of Papua New Guinea, beginning in 2007.
- I heard that mobile devices were also popular in remote Aboriginal and Torres Strait Islander communities.
- I saw global educational uses of mobile devices within one organisation.

The idea that resonated with me was to find out what Aboriginal and Torres Strait Islander pre-service teachers thought about using mobile devices in their tertiary study through a community-based ITE program and whether they were already doing so while living in very remote communities. As I had lived in the APY Lands, it

seemed appropriate to have AnTEP as a focus of the research.

I raised the idea of the research with four key stakeholders. The first was a distinguished Aboriginal academic (whom I knew from my teaching years in the APY Lands in the period 1984–1986, and who that month was preparing the Scoping Plan for the national More Aboriginal and Torres Strait Islander Teachers Initiative); the second was the Coordinator of AnTEP at UniSA; the third was the Director, Anangu Education Services, Department for Education and Child Development (whom I had first met in 1983 as the principal of the school where I did my professional experience internship); the fourth was the Pitjantjatjara linguist (whom I had known since 1983 and for whom I had recently worked at the Bible Society). All four endorsed the proposed research.

The idea for the PhD research project arose from my own experiences. It was not a direct suggestion or request initiated by Aboriginal and Torres Strait Islander people. Yet, as detailed in section 4.2, over many years, Aboriginal and Torres Strait Islander people had constantly voiced concerns about both the lack of Aboriginal and Torres Strait Islander teachers in the schooling workforce and the low completion rates for ITE programs.

In summary, my decision to commence this research was based on my life experience of about 30 years of cross-cultural relationships, input from four key stakeholders – three of whom I had known since 1983 or 1984 – and the public demands of Aboriginal and Torres Strait Islander people over several decades. As Nakata (2014, p. iv) said, I am "committed to undertaking ethical research", and the following section discusses what ethics looks like in this context where relationships are so important.

5.2.3 Ethics

Guillemin and Gillam, as cited in Ellis (2007) suggested two dimensions of ethics for researchers: procedural ethics and ethics in practice, or situational ethics. To these, Ellis added a third: relational ethics. She stated:

> Relational ethics recognizes and values mutual respect, dignity, and connectedness between researcher and researched, and between researchers and the communities in which they live and work. … Relational ethics requires researchers to act from our hearts and minds, to acknowledge our interpersonal bonds to others, and initiate and maintain conversations (Ellis, 2007, p. 4).

As indicated in section 3.5.2 and at the start of the chapter, for Aboriginal and Torres Strait Islander people there is a fundamental tenet of relatedness in constructing a

sense of identity or being. In order to initiate, nurture and sustain enabling relationships in the research context, Aboriginal and Torres Strait Islander people have identified core values, principles and guidelines. These have been formalised by peak bodies. Of particular relevance to this research are those of the National Health and Medical Research Council (NHMRC), and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS). The NHMRC (2003, p. 8) identified six values on which research guidelines are built: spirit and integrity, reciprocity, respect, equality, survival and protection, and responsibility. AIATSIS (2012, p. 3) listed 14 principles of ethical research grouped under the following six categories:

- rights, respect and recognition;
- negotiation, consultation, agreement and mutual understanding;
- participation, collaboration and partnership;
- benefits, outcomes and giving back;
- managing research: use, storage and access; and
- reporting and compliance.

In the case of doctoral candidates, universities prohibit research commencing until approval is granted by an ethics committee, particularly where the research has human participants and especially when these are Aboriginal and Torres Strait Islander people. This is an example of procedural ethics as mentioned by Guillemin and Gillam, and cited in Ellis (2007). There is a danger that filling in an ethics approval application form becomes an exercise in ticking boxes, contributing to what Thrift (2003, p. 115) called an “audit culture”. The ethics committee’s handling of numerous such applications could become like a factory production line, and so this might be termed “manufactured ethics”.

In considering ethics, Hall (2014a) used concepts from the Aboriginal writer Arbon (2008) to propose that the academic institutional approach to ethics is axiological, whereas that of Aboriginal and Torres Strait Islander people is ontological. Complying with an ethics committee’s guidelines is generally seen as axiological in that it “is a way of behaving that we can choose. It is a set of values that we can take on so as to inform our behaviour in certain contexts” (Hall, 2014a, p. 336). She further suggested these “approaches to ethics may be at odds with many Indigenous knowledge traditions and understandings about the correct way to do things. Here, the values of relationship and reciprocity are central and these are ontological in nature” (Hall, 2014a, p. 336). Arbon (2008, p. 34) stated: “For the

Arabana, becoming who you are is accomplished by knowing your reciprocal relationships". She also insisted that people demonstrate "right action" and that people have a responsibility to ensure "the appropriate outcome" (2008, pp. 51-52). Talking further about ethics, Hall (2014a, pp. 338-339) advocated for "an ethics of relational responsibility" where "the ethics of research in the intercultural space might become more about connection and encounter, than about risk mitigation".

Martin (2008) had earlier focused on the notion of connection when she discussed the agency of Aboriginal people in their relations with outsiders. She noted there could be a progression of relationships, from being an outsider, to being one who is known about, to ultimately being one who is known as a friend (2008, p. 9). The transition was expressed as respectful processes of "coming amongst" and "coming alongside" (Martin, 2008, pp. 121-122). I have selected four areas of sensitivity to demonstrate how I sought to act with reciprocal and respectful relational responsibility during my research journey.

5.2.3.1 Gender

Prior to the research I was aware that the majority of participants were likely to be female. I recognised that as a male, white academic researcher working with mainly female Aboriginal and Torres Strait Islander pre-service teachers there could be allegations of sexual impropriety or of coercion regarding responses or there could be simple misunderstanding of responses. For these reasons, women who volunteered for interviews were given the option of coming individually, in pairs, in larger groups or to have their support teacher or some other person present. Furthermore, participants were asked to nominate where they wished the interview to be held. In all cases, interviews were conducted in public places, either with other people present or in view of other people. Some interviews were conducted outside. If interviews were held inside I ensured doors were open or unlocked so we could easily be interrupted; most times I sat furthest from the door, so that participants could exit easily. These strategies were ways in which I sought to "come amongst" the participants and build respectful relationships.

5.2.3.2 Confidentiality

Aboriginal and Torres Strait Islander epistemological perspectives include collective rights to knowledge, custodianship and control and organisation of knowledge (Martin, 2008; Nakata, 2007). These take varying priorities in different contexts. As indicated above, participants were given the option of having joint meetings with me. The topic of the research was seen to be of collective interest, and participants were happy for others to know their thoughts on the matter. Instead of insisting on

Western academic research practices, such as private meetings with no-one else knowing what views an individual expressed, I melded with Aboriginal and Torres Strait Islander protocols and values. Confidentiality is generally seen in Western academia as a necessary requisite to ensuring that research is rigorous. However, in cross-cultural contexts, other practices may contribute to building rigour. For example, in reporting survey work within an Aboriginal and Torres Strait Islander community, Hing, Breen and Gordon (2010, p. 549) stated they had extended discussions and consultations about the questions to be included in their survey. They asserted

> While the results of these discussions and actions may ordinarily appear to bias the results in a general population survey, in this research they more likely assisted in the reliability and validity of the findings. This is because the questions asked in the survey were ones that could be answered accurately by the respondents. These consultation processes assisted in building ethical rigour into the research project.

In the same way, in this research, I respected the nature of the participants' relationships and their lack of concern about confidentiality and their willingness to share their opinions in joint interviews and focus groups. Like Hing et al.(2010), I suggest this has enhanced the reliability, and validity of the findings and the rigour of the research. Reliability was improved as common understandings of the questions were shared between participants, and thus an individual's response was more likely to be "on target". Validity was increased as a shared base of knowledge about the questions facilitated opportunities for more participants to offer their views with a degree of self-assurance. Rigour was strengthened in two ways: by aligning with cultural values and practices and by gaining a nuanced understanding of responses to the research questions as well as of appropriate research procedures.

5.2.3.3 Anonymity

Given the relatively small population in very remote communities and the limited number of personnel in schools and learning centres, I anticipated it would be virtually impossible to guarantee anonymity for participants. As a visitor in these locations, my presence was obvious. So too, it was evident when people met with me. I was dependent on site leaders for permission to visit learning centres and reliant on support teachers and other staff to coordinate times for participants to meet with me.

As indicated above, Aboriginal and Torres Strait Islander views of epistemology can include both collective ownership and awareness of the person who is the knowledge custodian. When referring to work done with Aboriginal and Torres Strait Islander people, Christie, Guyula, Gotha, & Gurruwiwi (2010, p. 70) pointed out that

their university Human Research Ethics Committee

> accepts our contention that the knowledge authorities that we work with **insist** that they are identified as the source of their comments. That is a fundamental ethical consideration of Yolŋu knowledge work. Truth claims are assessed in the first instance on the basis of the claimants' right to speak. So de-identification compromises our ability to assess the evidence. While it is important for some types of research, it is unacceptable in Yolŋu collaborative knowledge work [emphasis in original].

With further regard to anonymity, in a study looking at the use of ICT in an Aboriginal and Torres Strait Islander community, Eady (2010, p. 91) commented:

> [T]he community council members and community focus group members chose to be named and consented in writing that their full names be revealed in the Acknowledgements section of the thesis. The community was very proud of their efforts in the process of this research and creation of their presentation and while did not see the need to have their names attached to each quotation that they had made, they did want to be acknowledged and for the audience to know who they were and what community they came from.

Given these precedents, my application to my university's ethics committee stated that if participants requested their names be used, then data would not be de-identified. This approach was endorsed by my university's First Nations Centre as part of the approval process through the ethics committee. When collecting data, I raised the matter of anonymity and gave people the options of using their names, pseudonyms or no names. At the time, most people did not indicate a preference for any of the options. When transcripts were sent to participants for checking, people were invited to indicate their preference. I received no responses. In the absence of clear indication of preference, I have elected to supply quotes from participants anonymously, as this minimises potential disputes in the future, which could arise if I used people's names and they or another person later objected.

5.2.3.4 Reference groups

In seeking to show respect to local communities and cultural protocols and foster collaboration, I planned to form reference groups of people who could guide the research in that place. However, this did not happen during data collection, for the following two reasons. First, some leaders of the ITE programs, staff at those sites and participants themselves saw no need to involve community members. Second, at some sites I was able to stay for only one or two days and some staff at those sites said there was not enough time to organise for a community reference group to meet and make suggestions about conducting the research.

In this research, ethics is viewed through an ontological lens, with an awareness of

relational responsibility. The details just provided of steps I took regarding four sensitive areas showed how I sought to actively come amongst and come alongside others in the research. This concept of coming alongside has shaped my approach to the research, and I consider that it generates a positive stance for positioning a researcher, particularly for a non-Indigenous researcher working with Aboriginal and Torres Strait Islander participants. In the following section, I continue to story my methodology and relate my experience of building relationships and seeking approval for my ethics application.

5.2.4 Building relationships

As previously stated throughout this thesis, I have taken seriously the obligation to develop reciprocal and respectful relationships. This has involved intellectual endeavour in conception of the research design, evaluation of events during field work and analysis of findings. Moreover, significant time was invested in cultivating relationships prior to ethics committee approval and in maintaining and enhancing relationships throughout data collection and subsequently. I include here three vignettes that highlight these processes and the impact these had on the research.

From my cross-cultural experience in bilingual situations I knew that relationships are enhanced when people speak the same language, especially when a person from a dominant language makes the effort to use a minority language. All AnTEP participants speak Pitjantjatjara and, as I had previously learned this language, I wanted to be able to use it again. My intent was to demonstrate my respect for the research participants' Pitjantjatjara language and knowledges, position myself as a learner and facilitate rich conversations with participants. At the start of 2012, before I enrolled in the PhD, I commenced weekly Pitjantjatjara classes through the School of Languages in Adelaide. I attended both the beginner and advanced courses. The Ananangu woman who was tutor for the beginner course was the daughter of a respected elder whom I had met in the 1980s, who continues to be a significant voice in Ananangu affairs who is the land custodian who criticised the Songlines project. I believe our positive personal relationship throughout 2012 was a key factor in Ananangu being willing to entertain the possibility of permitting further research, despite the aforementioned "extreme tension" (Rothwell, 2014) about research arising from the Songlines project. Over the following years, she became an associate of the CRC REP Remote Education Systems project and we met numerous times in various locations; from her, I gained insights into issues of concern to Ananangu. She also assisted in transcribing and translating vernacular portions of participants' interviews, which enabled me to understand nuances in participants' responses, thereby enhancing my analysis of findings and drawing out

implications and proposing recommendations.

The Anangu woman tutor for the advanced course was the younger sister of one of my pupils when I was a teacher on the APY Lands. After enrolling in the PhD, and prior to ethics approval and before collecting data, I visited the community where I had previously lived, and I stayed with one of her younger brothers. It was my first time back for about 27 years. This was an emotional experience, meeting people whom I had known before, and their children and grandchildren; meeting new people; learning of the deaths of others; visiting the cemetery, and attending a football game at another community. With people from my host community, I travelled by local bus to Alice Springs. A week later, at a conference for staff from Anangu schools, while I was showing people photos of my recent trip to the community, I was informed that one of the women in the photos had died a few days earlier. I burst into tears, and they consoled me. This further strengthened relationships with the Anangu Education Workers (AEWs) and with members of the PYEC. I believe the shared grief was a significant element in the PYEC granting approval for the research less than a week later.

These first two vignettes demonstrated the impact of relationships with two Anangu women which commenced before I started the PhD. This final vignette also highlights the ongoing influence of relationships with members of a key stakeholder group which began very early in my candidature. The day after enrolling in the PhD, I flew to Alice Springs to attend a conference run by the National Alliance of Remote Indigenous Schools. While there, I met a senior official in the Far North Queensland Region of the Queensland Department of Education, Training and Employment and arranged a meeting with RATEP leadership a few weeks later in Cairns. I met him again twice in Cairns before the scheduled meeting with RATEP leaders from both the Department of Education, Training and Employment and the Tropical North Queensland Institute of TAFE. From that first meeting, RATEP leaders have been positive and supportive of the research. Over the ensuing years I have met RATEP leaders at different sites in Queensland and at conferences in Adelaide, and we have kept in regular contact through telephone calls and emails. They facilitated field trips to collect data from participants, and they checked writing I have done based on the research.

These are three examples of how I intentionally built relationships with people, from even before I enrolled in the PhD. They demonstrate my phronetic approach to the research and my commitment to embody the ethical guidelines established by the two peak bodies NHMRC and AIATSIS. This ongoing personal engagement with

stakeholders promoted trust, reciprocity and collaboration, which enhanced the research. A table outlining major contacts with stakeholders throughout the course of the PhD is presented as 9.1 Appendix A. This provides evidence of the extensive focus I invested in building and maintaining relationships.

5.3 Doing

Martin (2008, p. 130) highlighted the centrality of respect in relationships in research: “The term ‘respect’ is an essential feature for establishing and maintaining relatedness amongst and alongside Aboriginal *People*” [emphasis in original]. This part of the chapter has three sections that describe participants, data collection and limitations of the research.

5.3.1 Participants

5.3.1.1 The population

The target participant population for my research is Aboriginal and Torres Strait Islander pre-service teachers in the two community-based ITE programs: AnTEP and RATEP. In 2013, there were around 40 students enrolled with AnTEP and about 120 with RATEP, to give a total population of about 160. All the AnTEP students were studying part-time and working part-time as AEWs or Anangu Coordinators in Anangu schools. Furthermore, in discussion with AnTEP leaders, the Director of PYEC, staff in schools in the APY Lands and others with experience among Anangu, I recognised that in South Australia, virtually all enrolments in AnTEP were from AEWs employed in schools. This is a legacy of the beginnings of the course (see section 2.2). AEWs were seen as potential tertiary students in AnTEP. Stakeholders suggested that their views could add richness to the data. Hence, I decided to expand the target participant population to include AEWs in South Australia who were not enrolled in AnTEP. This added about another 20, so bringing the participant population to about 180.

5.3.1.2 The sample

The original idea was to have three or four participants from each of three communities in the APY Lands to give a group associated with AnTEP of about 10–12 people (of the possible 60 mentioned above). The plan was to have participants from the community where AnTEP started, the first government community and the community where I had lived. In Queensland, the idea was to have five or six participants from the Torres Strait Islands, as this is where RATEP started, and another group of five or six people who were off-site students from other very remote areas of Queensland, to give a group of 10–12 people associated with

RATEP (of the possible 120 mentioned above). This sample of 24 people would be about 13% of the population of 180. This compares favourably to a recent survey of Aboriginal and Torres Strait Islander adults in South Australia which aimed for a sample of 15% (Marin et al., 2015, p. 3).

The sampling technique aimed to build on the relational foundation that had been established with leaders in the two programs, departmental personnel, school principals and staff. A key was the support teacher on-site at the learning centre (in AnTEP these are called Tertiary Tutors; in RATEP they are called Teacher Coordinators). Through the process of building relationships during 2012–2013, support teachers were made aware of my research. In South Australia, I supplied principals and support teachers in Ananangu schools in the APY Lands with material about the research. The Queensland Department of Education, Training and Employment RATEP Coordinator contacted all RATEP support teachers and arranged a teleconference for me with those who were interested to learn more of the research. This included personnel from very remote sites, other sites, and the off-site coordinator. Following this teleconference I provided material to those support teachers. The material comprised: (1) a “call for participants” poster, including a URL and QR Code to an online video clip of me explaining the research (see 9.2 Appendix B), (2) a letter of introduction (see 9.3 Appendix C), (3) an information sheet (see 9.4 Appendix D), (4) consent forms for interviews (see 9.5 Appendix E), and (5) a list of questions (see 9.6 Appendix F). They were asked to share these with potential participants to alert them to the research and any perceived burdens or risks. People interested in participating notified their support teachers, who then advised me. This enabled me to plan a travel itinerary.

In 2013, I discovered from the leader of the coordinating entity in the Torres Strait Islands that it had withdrawn from RATEP, and it was not possible to conduct research there (J. Ketchell, personal communication, June 24, 2013). This was confirmed by the leader of RATEP in the Queensland Department of Education, Training and Employment. In Queensland, initial interest was expressed by students from “Other sites” (i.e. not very remote communities). I felt this cohort would provide interesting data which would enrich the overall investigation. I received invitations to visit eight of the Other sites in Queensland. This was far more than I had planned in thinking about the sample size for the research. However, I felt it would be rude to decline any offers, and that I should accept them all. Due to time limitations I was able to visit each of these Other sites in Queensland for a maximum of two days. After data had been collected from these Other sites, I liaised with RATEP leaders and arranged to collect data from two very remote communities in 2014. This was

done to maintain the original research design of having participants in both AnTEP and RATEP from very remote communities.

In both states, sampling on field visits happened through a mixture of meetings with volunteers, who had pre-planned to meet me and liaised with their support teacher and other school staff to do so, and spontaneous snow-balling – in which participants encouraged their associates to take part. With my decision to not refuse any who offered, this meant that I had an open approach over the size of the final sample.

5.3.2 Data collection

Martin (2008, pp. 130-133) developed protocols for research with Aboriginal and Torres Strait Islander people – that would show respect for the participants' land, laws, elders, culture, community, families and futures. She emphasised the researcher needed to take responsibility for keeping those rules and specified 12 strategies for achieving researcher self-regulation:

- have one place on country for the main research activities
- ask permission before visiting that place
- care for country
- do not take anything from country
- do not go anywhere on country unless taken by a local person
- give priority to the needs of local people
- take no alcohol or drugs onto country
- privilege the voices of the people
- keep informing local people about the research
- respond to any questions from local people
- be reliable
- enhance local people's vision for the future.

I endeavoured to embody her rules for respect and strategies for self-regulation as I came amongst and sought to come alongside the Aboriginal and Torres Strait Islander participants in this research.

5.3.2.1 Semi-structured interviews, focus groups, and yarning

As indicated at the start of this chapter, one method endorsed by Aboriginal and Torres Strait Islander writers for obtaining qualitative data is storywork. However, given the aim of the research, I thought that unguided yarning might fail to focus on issues pertinent to the research. So I chose to use semi-structured interviews with

open-ended questions as a means of allowing participants to provide information on specific matters in the manner of their choosing (see 9.6 Appendix F). Interviews are used by both Indigenous and Aboriginal and Torres Strait Islander researchers as well as non-Indigenous researchers as a means to focus attention (Bainbridge et al., 2013). However, Martin (2008, p. 95) criticised structured and semi-structured interviewing as being "inadequate because direct questioning is incongruent for two reason[s]. First, direct questions are considered intrusive, disrespectful and damaging to relatedness. Second, they are not part of the epistemological processes of Aboriginal knowledge acquisition". This is a strong statement, yet other perspectives are also pertinent. At the cultural interface there are tensions and choices, and people demonstrate competency in two worlds. As Nakata (2003, p. 27) pointed out in discussing the cultural interface, "Nevertheless, Indigenous peoples do traverse these intersecting discourses on a daily basis, responding, interacting, taking positions, making decisions and in the process re-making cultures – ways of knowing, being and acting". He further stated: "It is about maintaining the continuity of one when having to harness another and working the interaction in ways that serve Indigenous interests, in ways that can uphold distinctiveness and special status as First Peoples" (Nakata, 2003, p. 28).

In the case of this research, I had confidence in the competence of participants to "traverse" the cultural interface and "harness" semi-structured interviews to "serve [their own] Indigenous interests". Moreover, I found within Martin's metaphor of storywork as "fishing for information" (2008, pp. 95-96) techniques which I believed could equally be applied to the use of semi-structured interviews. She talked about different types of fish, the water, times of day, seasons, bait and tackle, re-baiting the hook and trying again:

> In terms of Storywork, depending on the topic and its nature, if the bait has been chosen well the response could come as a parallel observation or comment, or change of topic. … Whilst there can be silences, there can also be much animation, passion and humour and equally much tension as topics are explored, glossed over, contested, ignored or used as a catalyst for further topics to be discussed. Whatever the emotion or mood, these processes seek to serve relatedness by maintaining respect, accountability and responsibility in the way involvement is sought and participation is cultivated (Martin, 2008, p. 96).

I also felt that my years of experience working alongside people from cultures different to my own gave me sensitivity and skills to assist people to feel at ease and be willing to share their thoughts and emotions.

I wished to obtain individual and joint interviews and hold focus group discussions. Focus groups have "synergistic potentials", as they emphasise discussion among

participants (Kamberelis & Dimitriadis, 2011, pp. 556-560). They are seen to be relevant in cross-cultural contexts and are viewed as a culturally sensitive data collection method for research in cross-cultural settings and research with ethnic minorities (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2007; Liamputtong, 2011). Focus groups are appropriate in research with Aboriginal and Torres Strait Islander people:

> The value of focus group interviews in the Aboriginal context can be supported on cultural and political grounds. … [It] allows for the public control and display of knowledge … where those who speak do so from positions of authority and ownership of knowledge (Willis, Pearce, & Jenkin, 2005, pp. 115-116).

Some writers have advocated yarning circles as a culturally appropriate way for Aboriginal and Torres Strait Islander people to share (Fredericks et al., 2011; Martin, 2008; Robertson, Demosthenous, & Demosthenous, 2005; Walker, Fredericks, & Anderson, 2012). Fredericks et al. (2011, p. 13) suggested that:

> As a research tool, yarning is supportive and facilitative of both Indigenous ways of working … and knowledge sharing … It is a research strategy that assists in decolonising, repositioning and supporting Indigenous knowledges and research methods … It can be used as an 'Indigenist methodology' …

Walker, Fredericks and Anderson (2012, p. 272) pointed out that while yarning, "women followed cultural protocol, and recognised existing relationships and expected outcomes. The yarning contributed to the ways in which the Indigenous women … related with each other and helped to determine accountability between them". Small group and focus group discussions can embody similar aspects as yarning circles and were seen as an appropriate method to use for collecting qualitative data.

Participants could provide as much or as little information as they desired or opt not to answer a question. I asked to record the interviews, so these could be listened to again and transcribed in order for me to analyse them. As the participants were pre-service teachers and/or AEWs, the interviews were conducted in English. At times, participants from the APY Lands spoke in the Pitjantjatjara language. I understood some comments, and, if not, I requested translation to English at the time. Subsequently, I employed translators to provide a transcript with both vernacular and English. A few students gave permission for photographs to be taken (see 9.7 Appendix G for the consent form).

5.3.2.2 Sites

During 2013 and 2014 I conducted five field trips to collect qualitative data. Table

5-1 shows details of the trips.

Table 5-1 Field trips to collect qualitative data

Date	State	Unique sites visited	Sites with a repeat visit
18–24 August 2013	SA*	4	1
9–19 September 2013	SA	1	1
4–25 November 2013	Qld†	8	
2–8 March 2014	Qld	2	
8–26 March 2014	SA	1	4
Total unique sites		16	
Notes	*SA = South Australia; †Qld = Queensland		

I visited 16 sites in South Australia and Queensland to obtain qualitative data; six in South Australia and 10 in Queensland. In South Australia people at one site chose not to participate. Thus participants came from 15 sites. Some sites in South Australia were visited more than once for four reasons (1) during my initial visit, people sought additional information about the research in order to make a choice about participating and requested I return, (2) at the time of my initial visit, events (past, present or future) in the school and/or community took precedence over the research and it was not convenient for people to participate so I arranged a second visit, (3) when I visited the first time, some people indicated they were interested to participate, but something prevented them attending interviews and I went back in case they were available, and (4) during my first visit participants recommended a person not present so I returned to meet that person. It was not possible to make repeat visits to sites in Queensland due to limited finances.

All South Australian sites and two sites in Queensland were classed as very remote. Information for very remote sites is summarised in Table 5-2.

Table 5-2 Very remote sites – features and participants

Site number	1	10	11	12	13	14	15	Total SA*	Total Qld†
State	SA	Qld	Qld	SA	SA	SA	SA		
Mobile network	No	Yes	Yes	Yes	No	No	No		
Study centre	Yes	Yes	Yes	Yes	Yes	Yes	No		
Total unique Participants	5	6	5	6	10	7	6	34	11
Notes	*SA = South Australia; †Qld = Queensland								

There were 45 participants from seven very remote sites. Four of the five communities in SA did not have mobile network services. Funding was announced

in mid-2015 for five communities in the APY Lands so that mobile network services will be available by mid-2018 (Department of Communications and the Arts, 2015). In Queensland I visited eight sites that were not very remote communities. One was classed in the Australian Statistical Geography Standard (see section 1.3.1) as Inner Regional, and there were seven sites in Outer Regional areas; together these eight sites are labelled as “Other”. Information for Other sites is summarised in Table 5-3.

Table 5-3 Other sites – features and participants

Site	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**
Remoteness	OR*	OR	OR	OR	OR	OR	OR	IR†	
Mobile network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Study centre	Yes	Yes	Yes	Yes	Yes	No	No	No	
Total unique Participants	2	4	3	5	2	1	1	1	19
Notes	*OR = Outer Regional; †IR = Inner Regional								

There were 19 participants from eight Other sites – all in Queensland. All sites across Queensland, regardless of remoteness classification, had mobile network service.

Information about the number of occasions for each mode of interview for all sites is summarised in Table 5-4.

Table 5-4 Mode of interview by number of occasions and remoteness of site

Mode of interview	**Occasions**		
	Sites		Total
	Very remote	Other	
Individual interviews	10	17	27
Joint interviews	17	1	18
Focus groups	3	1	4

As indicated when discussing ethics regarding gender (5.2.3.1) and confidentiality (5.2.3.2), some participants were involved in more than one mode of interview. This is shown in Table 5-5.

Table 5-5 Mode of interview by number of participants and remoteness of site

Mode of interview	**Participants**		
	Sites		Total
	Very remote	Other	
Individual interview	8	13	21
Joint interview	17	2	19
Focus group	6	0	6
Interview + joint interview	0	0	0
Interview + focus group	2	4	6
Joint interview + focus group	12	0	12
Total participants	45	19	64

Of the 27 people who had individual interviews, six also took part in focus groups. Of the 31 people involved in the joint interviews, 12 also took part in focus groups. Of the 24 people involved in the four focus groups, six were not involved in any other form of data collection.

Characteristics of the research sites may impact the adoption of mobile devices by participants. The following comments for very remote communities (in this paragraph) and other sites (a later paragraph) are based on information from the Australian census in 2011 and available on the Australian Bureau of Statistics "QuickStats" website. Due to confidentiality constraints, individual URLs for specific communities will not be provided here. There were marked differences in the nature of very remote communities in the two states. The two very remote communities in Queensland had larger populations than those in South Australia. One was a mining centre with a population of just over 3300 people, of which around 600 were Aboriginal and Torres Strait Islander people (about 19% of the population). The other very remote community in Queensland had a population of just over 1,000, of which around 850 were Aboriginal and Torres Strait Islander people (about 81% of the population). Both communities are open access, and have significant industries. The larger is part of the mining sector and the smaller community benefits from the tourism sector, with 60,000–70,000 people visiting the area each year (Thomson, 2011, p. 19). The median weekly personal income for people aged 15 years and over in the larger community was $1240, and in the smaller community it was $559, to give an average of $900. In contrast, the five very remote communities in South Australia were much smaller, ranging from 90 to 440 people, with Aboriginal people comprising 87–100% of the population. All communities in South Australia have restricted access, that is, by permit only. The median weekly personal incomes for people aged 15 years and over ranged from $231–$321 with an average $262.

It is likely that in contrast to the participants from the very remote communities in South Australia, those from the very remote communities in Queensland had greater access to varied opportunities for employment, more interaction with non-Indigenous people from outside the community, a higher personal disposable income, and an increased likelihood of seeing other people use mobile devices for a range of purposes. Both the Queensland very remote communities had mobile network services, but four of the five South Australian very remote communities had no coverage. The five factors mentioned in this paragraph are likely to contribute to the general adoption of mobile devices.

Of the eight Other sites (all in Queensland), one is recognised as an Indigenous community of around 2400 people with about 97% of the population identifying as Aboriginal and/or Torres Strait Islander. The median weekly personal income for people aged 15 years and over is $274. It is an open access community and is only 50 km by sealed road from a major town and several industries. In terms of percentage of population identifying as Aboriginal and/or Torres Strait Islander and with regard to income, this community has similarities to the very remote communities in South Australia. Across the remaining seven Other sites, populations ranged from about 1,400 to 133,000 people. The percentage of Aboriginal and Torres Strait Islander people varied from 4% to 21%. There were a variety of industries (including mining and tourism), with median weekly personal incomes for people aged 15 years and over ranging from $376 to $716, with an average of $548. These factors suggest that these Other sites have greater similarity to the two very remote communities in Queensland than to those in South Australia.

5.3.2.3 Demographic data

The purpose of the qualitative interviews was to provide an opportunity for participants to voice their opinions about their beliefs and behaviours regarding the use of mobile devices in their tertiary study. It was not primarily an exercise in collating demographic data. However, in reviewing material gathered from the participants, some attributes of the participants were gleaned (see Table 5-6).

There were 64 participants, which is 36% of the estimated target participant population of 180. This greatly exceeds the planned figure of 13% and more than doubles that of 15% sought by the large survey of South Australian Aboriginal and Torres Strait Islander adults (Marin et al., 2015). Roughly equal numbers of people participated from each state: South Australia = 34; Queensland = 30. There was an overwhelming majority of female participants across both states: Female = 55; Male

= 9 (86%:14%). Participants were not asked to provide their dates of birth. Current age was estimated through a combination of other information obtained during interviews, such as age when they left school, years spent in jobs or length of time after school. Across both genders, South Australia participants were older than those from Queensland: 26 of 34 (76%) compared to 21 of 30 (70%) were 25 years of age or older. This shows that more community-based ITE students and potential students were in the older age bracket than the national statistics for 2011, which had 41% of higher education students aged 25-64 years (Australian Bureau of Statistics, 2013d).

Table 5-6 Participants by state, gender and age

Age	**State**				**Participants**
	South Australia		Queensland		
	Gender				
	Female	Male	Female	Male	
<25	8	0	8	1	17
25+	23	3	16	5	47
Sub-total	31	3	24	6	
Total	34		30		64

The following section describes factors that affected the process of data collection.

5.3.2.4 Factors affecting data collection

A large number of factors out of the control of the researcher impact on people's willingness and availability to participate and on the researcher's ability to conduct the research. This is particularly so in remote locations. For this research, these factors included weather, road conditions, vehicle issues, community events, ceremony, illness, visitors, work and study.

In many situations, community events took priority over participation in the research. The opening hours of shops, the arrival and departure of planes or buses, fights, deaths and mourning activities affected people's interest in being interviewed. In central Australia, ceremonial activity closes roads and prevents travel for non-participants in the ceremonies. I had to adjust my itinerary to avoid such a situation. Both participants and researchers can get sick. I stayed healthy, but several people who had planned to participate in the research did not because they were ill. In all cases, I had to negotiate dates for field trips with regard to expected visits to sites by other people. In some situations, other visitors changed their schedule or arrived with short notice, and this hindered people's participation in the research.

Many participants worked in schools. In some cases they were not given permission to be released for the research during work hours, and I had to wait until school was over before interviewing them. In other cases, they had planned to see me, but changing circumstances in the school meant they were required elsewhere and so they did not come to see me, or we were interrupted and the person left for other duties. Other people had full- or part-time employment and came when they were free. On three occasions I visited people at their workplace. Interviews had to be fitted around students' requirements, such as participation in scheduled web-conferences; telephone consultations with lecturers; assignments; and absences due to professional experience internships, residential lecture blocks and graduation activities.

5.3.2.5 Limitations of the data

5.3.2.5.1 Pre-interview consideration of the interview questions

Information about the research was sent to sites ahead of data collection. However, in some cases the site coordinator did not pass on the material, and some volunteers did not look at the material. It appears that in the majority of cases, volunteers had not given much thought to the topic prior to the interview. Thus their responses were not as rich as I desired, particularly in regards to Interview Question 10: Can you describe ways that using mobile devices match these Aboriginal and Torres Strait Islander views of life?

5.3.2.5.2 Single interview occasion

I planned to interview people twice. However, financial and logistical constraints prevented this from happening, and so data was obtained through a single interview (unless the person volunteered to participate in a focus group). Length of interviews varied due to several factors, including the willingness of participants, experience of participants as AIEWs, prior commitments, and unexpected interruptions. The longest was 1 hour 34 minutes, and the average length was about 36 minutes.

5.3.2.5.3 Joint interviews and focus groups

When conducting interviews with two or more people, there is the possibility of one person dominating the responses. This may be more pronounced among Aboriginal and Torres Strait Islander people where cultural protocols govern who may speak in the presence of others due to kinship relations or status achievements and attributions. Furthermore, in joint interviews and focus groups, in some cases it was not possible later (from the recording) to identify every speaker, either through similarity of tone of voice or through background noises that spoiled the clarity of the audio recording. This prevented me identifying all participants.

5.3.2.5.4 Participant checking of transcripts

At the time of data collection, one person declined to be recorded. In most cases, soon after interviews were finished the audio recordings were downloaded to a computer in the learning centre, so participants could listen to the recordings at their convenience. In other cases, audio recordings were downloaded to a USB at a later time and passed on by a person going to that community, or were sent by email to the individual concerned, or were posted to a cloud service and a link sent to the person. Later when transcripts were completed, these were emailed either to individuals or to learning centres so that participants could compare transcripts with audio recordings of interviews. Of the 63 participants for whom audio recordings were available, only one indicated to me that she had checked the transcript and audio recording.

5.3.2.5.5 Demographic data

At the time of interviews demographic details were not intentionally collected. Before data collection began, background information provided by leaders of both AnTEP and RATEP indicated that the majority of pre-service teachers enrolled in the two community-based ITE courses were female. Of the 64 participants, nine were male and there were 55 female. When the number of responses from males was considered in terms of the sample of male participants, the results were skewed, as one response was equivalent to 11% (that is, one divided by nine is equal to 11%). This meant a large jump in percentage for male comments for every response by a male participant.

5.4 Knowing

Martin (2008, p. 97) stated that “in the Aboriginal worldview, there are diverse ways of knowing: those of thinking, feeling, and willing”. When discussing the research process, she used three of L. T.Smith’s notions of “Indigenist research projects” (L. T. Smith, 2012) – critique, re-framing and harmonisation – and linked these respectively to ways of knowing, ways of being and ways of doing (2008, pp. 97-98). In regard to ways of knowing and critique, she stressed that “the essential process of critique is discernment that requires astuteness of attention, intuition, inspiration and awareness of relatedness” (2008, p. 97). Earlier she had pointed out that “as a research project the emphasis of critique is the discernments and decolonisation of research and the agency it restores to Aboriginal *Peoples”* [emphasis in original] (2008, p. 83). In addition, Martin (2008, p. 84) emphasised that as ideas are held together in relatedness, this creates conceptual spaces that enable the perception of aspects of Aboriginal and Torres Strait Islander ontologies and epistemologies:

> The project of critique tells us how the Stories are related and thus how to create spaces, in particular the conceptual space, to draw forth elements from our own ontologies and epistemologies. In terms of relatedness theory, this requires that the ideas, thoughts and beliefs are held in relatedness and not segmented and separated from their contexts or realities.

The following section elucidates how awareness of this project of critique influenced my approach to data analysis.

5.4.1 Data analysis processes

5.4.1.1 Analysis on field trips

All participants except one agreed to audio recording of interviews. For this person, notes were taken manually. There were 27 individual interviews recorded, along with 18 joint interviews and four focus groups. These 49 occasions were encompassed by 51 audio recordings because some interviews were interrupted and so each of those interviews covered more than one recording. Audio recordings lasted about 30 hours. These ranged in length from 36 seconds to 1 hour 34 minutes 33 seconds. The average length was about 36 minutes.

On my first field trip, after I had conducted the interviews I began to listen to and transcribe the recordings, immediately analysing them for emerging codes, categories and concepts that could be used in subsequent interviews. However, this meant I was ignoring people. I believed it was more important to maximise the time spent with people and build relationships in casual and informal ways. Hence, on subsequent field trips I made no attempt to listen to audio recordings or to type up and analyse transcripts. Rather, as impressions and analytic ideas occurred to me, I jotted these down. My brief field notes constituted my methodological journal and included memos and intuitive impressions. I used these to guide emphases in interviews from day to day. As indicated in Table 5-1, I had five field trips to collect data. Between trips, I did the majority of the analysis. This led to theoretical sampling (see below) on subsequent trips as I pursued information about concepts and categories.

5.4.1.2 Transcribing and translating

I employed English-speaking people to assist in transcription and instructed them to leave gaps when they encountered Pitjantjatjara. Subsequently, I employed Pitjantjatjara-speaking people to transcribe the Pitjantjatjara and translate it to English. I entered all transcripts into NVivo software, as well as manually examining the transcripts for my analysis. I compiled my own spreadsheets and prepared diagrams to document material I found.

5.4.1.3 Grounded Theory construction techniques

As indicated in Chapter 3, I employed a phronetic constructivist approach to Grounded Theory. This recognised my own values and subjectivities, as well as deliberately beginning coding with general sensitising concepts drawn from existing literature in the field. As Charmaz (2014, p. 111) stated: “Coding means naming segments of data with a label that simultaneously categorizes, summarizes, and accounts for each piece of data.” She defined categorising as “selecting certain codes as having overriding significance or abstracting common themes and patterns in several codes into an analytic concept” (Charmaz, 2014, p. 341). According to Charmaz, “researchers can raise their main categories to concepts” (2014, p. 247), which she defines as “abstract ideas that account for the data and have specifiable properties and boundaries” (2014, p. 342). Charmaz (2015, p. 1615) advocated initial line-by-line coding ascribing gerunds to interpretively capture the gist of that line of the transcript, in order to engage with the data, spark ideas and move beyond simple description. Gerunds are “the English *-ing* form of a verb (*loving*) when in nominal function” (Macquarie Dictionary, 2015). This is a temporary step: “you only conduct line by line coding until you have codes that you want to explore. Then you take these codes and see how they account for further data” (Charmaz, 2012, p. 8).

Rather than focusing on topics or themes, Grounded Theory looks for processes, actions and meanings: “Coding for actions and processes helps researchers to define connections between data” (Charmaz, 2012, p. 5). Charmaz recognised the interpretive aspect of coding: “Ultimately, what you code reflects your interpretation and derives from the interaction that you have with the data. The codes result from what strikes you as happening in the data” (Charmaz, 2012, p. 8). These codes must have empirical validity: “A code that you treat as a tentative category must account for other data as well. You test the robustness of this category with other data” (Charmaz, 2012, p. 8). Charmaz (2014, p. 343) stated that “when grounded theorists write memos, they stop and analyse their ideas about their codes and emerging categories in whatever way that occurs to them”. Memos are tools to identify and analyse processes: “you begin to specify the conditions under which the process arises, persists, or changes. … Asking analytic questions in memos enables us to move swiftly from description to conceptualizing data” (Charmaz, 2012, p. 9). As a researcher writes memos, he or she can decide which codes can be elevated to become analytic categories. At this point further data is gathered to fill out or saturate the properties of the category, until no new properties emerge. This is termed theoretical sampling (Charmaz, 2012, p. 11). Charmaz (2014, p. 345) stated that “when engaging in theoretical sampling, the researcher seeks people,

events, or information to illuminate and define the properties, boundaries, and relevance of this category or set of categories". These processes kept me immersed in the transcripts and thus close to the participants. They enabled me to maintain the relatedness with them that had been established at the time of the interview.

5.5 Conclusion

This chapter had four parts. The first outlined the scope and design of the research. The research focused on two community-based ITE programs for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. A mixed methods approach that included both qualitative and quantitative data through interviews and a survey was intended to be used. However, survey data was insufficient for quantitative statistical purposes. So all data herein comes from qualitative interviews, apart from a small data-set included in the findings for Research Question 1. The remainder of the chapter was structured to reflect Martin's relatedness theory (2008), with each part focusing respectively on Being, Doing and Knowing. The second part of the chapter emphasised respectful relational ontology, researcher reflexivity, ontological ethics and the building of relationships prior to data collection, as examples of coming amongst the participants and other research stakeholders. The third part of the chapter pointed to the importance of respect for all interactions. The population was defined and sampling size and techniques identified. Data collection was described with reference to semi-structured interviews, details of sites, participants' demographic data, as well as factors influencing data collection. Limitations of the research were noted regarding depth and comprehensiveness of responses, ability to identify all participants' responses, and paucity of participant checking of transcripts. The final part of the chapter underscored the task of critique and the criticality of discernment to strengthen participants' agency to create conceptual spaces for evolvements of cultural philosophies. It outlined the processes of data analysis while on field trips, transcription and translation of audio recordings of interviews and Grounded Theory construction techniques. Throughout the chapter some elements were presented in yarning form. This way of "storying the methodology" was an intentional device to emphasise the importance of relatedness in all aspects of the research.

The next chapter presents findings from the data about the four research questions. These results identify the perceptions and practices of Aboriginal and Torres Strait Islander pre-service teachers studying in very remote communities about the use of mobile devices within community-based ITE programs.

6 FINDINGS

The aim of this research is to discover the perceptions and practices of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities about the use of mobile devices in tertiary study towards an ITE qualification. Previous chapters covered an introduction to the thesis, background to community-based ITE programs, matters about theory, review of the literature and methodology. This chapter sets out findings according to the four research questions (see section 1.8).

Thirteen questions were used during interviews and focus groups (see 9.6 Appendix F). Some of these were designed to elicit responses directly related to a particular Research Question and will be listed at the appropriate Research Question in this chapter. However, participants often included material relevant to a Research Question at other times throughout the interviews. In order to include this material and strengthen the evidence base, data presented in this chapter is not restricted to the specific interview questions linked to certain Research Questions, but drawn from the full gamut of the interview transcripts. I presented preliminary findings in earlier articles (Townsend, 2014a, 2014b, 2015a, 2015b; Townsend, Halsey, & Guenther, 2016).

This chapter is organised in five parts comprising findings from each of the four Research Questions, followed by a conclusion. Data for each Research Question is presented using a four-part framework:

(1) major findings based on data from all participants, and analysis of major findings under two headings, that is, cohorts of participants and characteristics of participants:

a) cohorts of participants

i) enrolled ITE students from very remote communities in South Australia and Queensland

ii) enrolled ITE students from Other sites in Queensland

iii) AEWs from very remote communities in South Australia

b) characteristics of participants

i) presence of mobile network service

ii) gender

iii) age;

(2) identification of emergent themes arising from responses;

(3) vignettes from participants; and

(4) overview.

A vignette is “a short piece of writing, music, acting, etc. that clearly expresses the typical characteristics of something or someone” (Vignette, 2016). In accord with my phronetic stance to valorise the voices of participants, selected quotes are provided to illuminate the findings and demonstrate the rich and nuanced evidence on which the findings are based. These are accompanied by commentary to highlight the issues and explicate the meanings of the quotes. Selections have been made from each of the three cohorts. Quotes from South Australian participants sometimes include Pitjantjatjara language which is shown in italics, for example, *Pitjantjatjara*, followed by a translation in English, which is presented inside square brackets preceded by a tilde, for example, [~ translation].

AnTEP did not use online learning, so there is a paucity of data from AnTEP very remote ITE students in South Australia. The program was in a wind-down phase during the research period. Nevertheless, the comments from AnTEP students and AEWs who are potential ITE students are valuable because the research sought data on the actual behaviours with mobile devices and also beliefs about the use of mobile devices. These perceptions about the use of mobile devices may contribute to the design of future tertiary offerings to Ananangu living in the APY Lands, and remote Aboriginal and Torres Strait Islander students generally.

6.1 Research Question 1 – Educational uses of mobile devices

> What elements of content material, administrative support, and personal encouragement for their ITE training do Aboriginal and Torres Strait Islander people in very remote communities use or want to see being provided by mobile technologies?

Two of the interview questions asked about the improvement of teaching and learning, and the delivery of the course through mobile devices.

> IQ 5. How could the teaching and learning in your ITE course be improved through using mobile devices?
>
> IQ 6. What are some areas of your ITE study that you would like to see delivered by mobile devices?

6.1.1 Major finding

The overall finding from Research Question 1 is that the majority of participants in the collection of qualitative data (40 of the 64 participants, or 63%) indicated at least one use or potential use of mobile devices for obtaining content, handling administration, sharing personal encouragement and promoting academic support. This finding accords with the work of Mishra (2009, p. vi) who identified three educational uses of mobile technologies that affect course completion: "Reminding students of deadlines, giving words of encouragement and providing bite-size learning snippets have a beneficial impact on motivation and make it more likely that students will complete and pass the course". Participants in this research indicated that encouragement could take two forms: personal and academic.

Table 6-1 presents data about the number of respondents who used mobile devices for each of the four purposes. The respondents varied for each of these four areas, hence a fifth column is included to indicate the total number of respondents who indicated any of the four areas of educational usage of mobile devices.

Table 6-1 Uses of mobile devices for content, administration, personal encouragement and academic support by number of respondents

Sample	**Uses of mobile devices, by number of respondents**				
	Content	Administration	Personal encouragement	Academic support	Any
64	33	33	20	27	40

6.1.1.1 Analysis by cohorts of participants

6.1.1.1.1 Very remote ITE students

The responses of AnTEP students (N=15) and RATEP students (N=11) are shown in Table 6-2. The overall finding from Research Question 1 is that the majority of pre-service teachers in very remote communities (14 of the 26 participants, or 54%) indicated at least one current use or potential use of mobile devices for content, administration, personal encouragement or academic support.

Table 6-2 Uses of mobile devices for educational purposes by number of pre-service teachers in very remote communities

Cohort	**Sample**	**Uses of mobile devices, by number of respondents**				
		Content	Administration	Personal encouragement	Academic support	Any
AnTEP	15	2	4	0	3	5
RATEP VR	11	9	7	7	6	9
Combined	26	11	11	7	9	14

The data for pre-service teachers in very remote communities shows that 82% (9 of 11) of RATEP students and 33% (5 of 15) of AnTEP students are currently using or have a desire to use mobile devices for any of the four educational purposes in their tertiary study towards an ITE qualification. A Chi-Squared Test shows the difference in percentage is significant (χ^2 (1)=6.00, p=0.01). This can be explained in two ways: first, AnTEP does not use online learning so there is no requirement to use mobile devices for educational purposes; second, most AnTEP students (13 of 15) come from communities with no mobile network service, and so are not able to use the full functionality of mobile devices on a daily basis.

The evidence from the majority (54%) of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities indicates that remoteness (i.e. physical distance from larger service centres) per se does not directly affect the use of mobile devices for educational purposes for tertiary study. There are already very remote students who are using and desire to use mobile devices in study towards an ITE qualification.

6.1.1.1.2 ITE students from Other sites

The original design of the research was to collect data only from very remote Aboriginal and Torres Strait Islander pre-service teachers. However, the opportunity arose to include RATEP students from Other sites (i.e. Inner Regional and Outer Regional areas). The overall finding from Research Question 1 is that all of the pre-service teachers in Other sites (19 of the 19 participants, or 100%) indicated at least one current use or potential use of mobile devices for content, administration, personal encouragement, or academic support. Table 6-3 shows data about RATEP students from Other sites.

Table 6-3 Uses of mobile devices for educational purposes
by number of pre-service teachers in Other sites

Cohort	Sample	Uses of mobile devices, by number of respondents				
		Content	Administration	Personal encouragement	Academic support	Any
Other	19	18	17	11	14	19

Chi-Squared Tests at 95% confidence level show no significant difference between RATEP students from Other sites and RATEP students from very remote communities across each of the four uses of mobile devices or for any of the uses. This lack of difference between the two groups of students in RATEP can be explained by the facts that these pre-service teachers are all studying the same course through RATEP, and all sites had mobile network service. This indicates that mobile learning is location neutral, that is, there is no difference regarding educational uses of mobile

devices attributable to the physical location or remoteness of a person. RATEP participants from Queensland highly value, actively use and desire to use mobile devices for a range of purposes in their tertiary study.

Chi-Squared Tests at 95% confidence level between RATEP students from Other sites and AnTEP students from very remote communities showed significant difference in usage of mobile devices for each of the four uses and across any use. The significant difference across all five comparisons can be explained by four reasons: (1) AnTEP does not use online learning, so there is no requirement to use mobile devices for educational purposes, (2) the majority of AnTEP students have little opportunity to use all the capacities of mobile devices because they live in communities without mobile network service, (3) people at Other sites most likely could purchase mobile devices earlier than AnTEP students in very remote communities, and thus they have had more time to become familiar with them, and (4) Other sites received mobile network services before very remote communities and thus, again, people in Other sites have had more opportunity to develop skills using the internet, calling and texting than people in very remote South Australian communities.

This evidence from the RATEP students in Other sites (i.e. not living in very remote communities) reinforces my claim that usage of mobile devices for educational purposes for tertiary study is independent of remoteness. Regardless of remoteness classification, Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs are using or desire to use mobile devices for their study towards a professional qualification.

6.1.1.1.3 RATEP online respondents

The mixed methods design of the research included a plan to collect data through a survey from a large sample of very remote Aboriginal and Torres Strait Islander pre-service teachers. However, only 12 RATEP students responded to the online survey. The overall finding from Research Question 1 is that all of these respondents (12 of the 12 participants, or 100%) indicated at least one current use or potential use of mobile devices per week for content, administration, personal encouragement or academic support. Table 6-4 shows data about RATEP students who completed the online survey.

Table 6-4 Uses of mobile devices for educational purposes
by number of RATEP students who completed the online survey

Cohort	Sample	Uses of mobile devices, by number of respondents				
		Content	Administration	Personal encouragement	Academic support	Any
RATEP Survey	12	10	12	10	10	12

In summary, this shows high usage of mobile devices for educational purposes. These figures are similar to those of RATEP students from both very remote communities and Other sites.

An anonymous pre-service teacher who completed the survey indicated the impact and benefits of mobile devices: “They're fast, efficient ways of communication and a lifeline to keeping tight schedules! I couldn't live without ’em ☺.”

6.1.1.1.4 Anangu Education Workers

The overall finding for AEWs from Research Question 1 is that over a third of them (7 of the 19 participants, or 37%) indicated at least one use or potential use of mobile devices for content, administration, personal encouragement and academic support.

Table 6-5 presents data about the number of AEWs who used mobile devices for each of the four purposes. The respondents varied for each of these four areas, hence a fifth column is included to indicate the total number of AEWs who indicated any of the four areas of educational usage of mobile devices.

Table 6-5 Uses of mobile devices for content, administration,
personal encouragement and academic support by number of AEWs

Sample	Uses of mobile devices, by number of AEWs				
	Content	Administration	Personal encouragement	Academic support	Any
19	4	5	2	4	7

Despite not being current tertiary students, and despite the majority of AEWs living in communities with no mobile network service (15 of 19, or 79%), almost 40% of AEWs stated an intention to use mobile devices for study purposes. This indicates they see benefits in so doing. These results are analysed further by three comparisons: with all ITE students, with very remote ITE students because AEWs live in very remote communities and with AnTEP students who live in the same very remote communities.

Chi-Squared Tests at 95% confidence level between AEWs and all ITE students showed all ITE students used mobile devices significantly more than AEWs for each of the four uses and across any use. The significant difference across all five

comparisons is to be expected and can be explained by first noting that the AEWs are not enrolled in a community-based ITE program, and have no current need to use mobile device for educational purposes. The comments they made were indications of future intention, apart from regarding administration, where actual use was reported for advising of absence and handling financial issues (as with AnTEP students). Second, 15 of the 19 AEWs live in communities with no mobile network service, which explains the lack of daily use of the full functionality of mobile devices.

Chi-Squared Tests at 95% confidence level show no significant difference between AEWs and very remote ITE students across each of the four uses of mobile devices or for any of the uses. This lack of difference between the two groups is surprising. Very remote ITE students could be expected to use or intend to use mobile devices more than people who were not studying. This unexpected result can be explained by the fact that 'Very remote ITE students' is a composite entity, and that the low level of use by AnTEP students skewed the data for the combined group (see 6.1.1.1.1).

Chi-Squared Tests at 95% confidence level show no significant difference between AEWs and AnTEP students, across each of the four uses of mobile devices or for any of the uses. This result is unexpected, in that it could be hypothesised that the AnTEP students would have greater opportunity and reason for using mobile devices for educational purposes than AEWs not enrolled in ITE. This unexpected result can be explained by the fact that AnTEP does not use online learning. Neither group has a need to use mobile devices for educational purposes, so there is little difference between AnTEP students and AEWs on their skill level and purpose of using mobile devices. In fact, in all but one category, more AEWs (by percentage) offered comments than did AnTEP students. The similarity between these groups when contrasted to RATEP students suggests that experience with online learning is a key pre-cursor to the educational use of mobile devices.

6.1.1.2 Analysis by characteristics of participants

6.1.1.2.1 Presence of mobile network service

The key finding from Research Question 1 is that nearly all participants (94%) from sites with mobile network service indicated at least one use or potential use of mobile devices for content, administration, personal encouragement and academic support; whereas at sites without mobile network service only 21% of participants provided responses. Table 6-6 provides information about educational uses of mobile devices by mobile network service for all 64 participants.

Table 6-6 Uses of mobile devices for content, administration, personal encouragement and academic support by mobile network service, by the number of participants

Mobile network services	Sample	Uses of mobile devices, by number of respondents				
		Content	Administration	Personal encouragement	Academic support	Any
Absent	28	3	5	2	2	6
Present	36	30	28	12	25	34

Chi-Squared Tests at 95% confidence level showed all participants at sites where mobile network services were present used mobile devices significantly more than participants at sites where mobile network services were absent for each of the four uses and across any use. This is not surprising and can be explained in two ways: first, people with services can make use of the full functionality of mobile devices, including accessing the internet and sending and receiving calls and texts. Second, most of those living in places without services were AEWs (15 of 28) with no specific need to use mobile devices for educational reasons.

6.1.1.2.2 Gender

Prior to data collection, background information indicated the majority of pre-service teachers enrolled in the two community-based ITE courses were female. In the period 2005–2010, 88% of graduates from TAFE Queensland North RATEP courses were female (Mitchell & Linkson, 2012, p. 26). For AnTEP courses in the period 2006–2011, 100% of graduates were female (AnTEP, 2013). Hence, I was aware that the majority of volunteer participants were likely to be female, and this was the case. There were 64 participants, of whom 55 were female and nine were male. The key finding from Research Question 1 is that nearly all male participants (89%) indicated at least one use or potential use of mobile devices for content, administration, personal encouragement and academic support; whereas 58% of females provided responses. Table 6-7 provides information about educational uses of mobile devices by gender (male/female) for all 64 participants.

Table 6-7 Uses of mobile devices for content, administration, personal encouragement and academic support by gender, by the number of participants

Gender	Sample	Uses of mobile devices, by number of respondents				
		Content	Administration	Personal Encouragement	Academic Support	Any
Male	9	8	7	2	5	8
Female	55	25	26	18	22	32

For three of the four educational uses of mobile devices and for ‘Any’, there was no

significant difference in the use of mobile devices between genders. Only for content did males use mobile devices significantly more than did females (χ^2 (1)=5.84, p=0.02). However, the small sample for males may overstate this case. In general terms, regardless of gender, these tertiary students face the same educational tasks and use mobile devices in similar ways.

6.1.1.2.3 Age

As mentioned in 5.3.2.3 at the time of interview, dates of birth were not recorded. Age at that time was estimated through combining miscellaneous data garnered through conversations and the interviews, supplemented by some information from course providers. The national Department of Education has two main categories of tertiary students: those aged less than 25 years and those 25 years and older. In the 2005 cohort, 79% were in the younger bracket and 21% in the older group (Department of Education and Training, 2014, p. 7). In contrast, among Aboriginal and Torres Strait Islander ITE students, there are usually more mature-aged students. Over the period 2007–2011, an average of 57% of enrolments were in the older group (Patton et al., 2012, p. 28). I expected that most volunteer participants would be mature-aged, and this was so: 47 of 64 (74%) were 25 years of age or older. The key finding from Research Question 1 is that the majority of both younger participants (65%) and older participants (62%) indicated at least one use or potential use of mobile devices for content, administration, personal encouragement and academic support. Table 6-8 provides information about educational uses of mobile devices by age for all 64 participants.

Table 6-8 Uses of mobile devices for content, administration, personal encouragement and academic support by age, by the number of participants

Age	**Sample**	**Uses of mobile devices, by number of respondents**				
		Content	Administration	Personal encouragement	Academic support	Any
<25	17	10	7	6	7	11
25+	47	23	26	14	20	29

There was no significant difference in the use of mobile devices for educational purposes between age groups across any of the five comparisons. This indicates that regardless of age, these tertiary students used mobile devices similarly in their study.

6.1.2 Emergent themes in findings from Research Question 1

6.1.2.1 Emergent theme 1: Participants use mobile devices to access content, mainly through their institutions' online learning management system / website, and expect to continue so to do.

Nine of the 11 RATEP students (82%) in very remote communities in Queensland and 18 of the 19 RATEP students (95%) from Other sites provided responses about content-related usage of mobile devices. South Australian participants were not using mobile devices for this reason, but two of 15 (13%) AnTEP students and four of 19 (21%) AEWs commented on the potential of so doing. Participants mentioned 143 terms relating to content, which were classified into seven groups: subjects, resources, readings, everything, institution's website, other websites and web-conferencing. Five of the terms for each group are listed in Table 6-9 to illustrate the range of material categorised as content that participants access through mobile devices.

Table 6-9 Selected terms to illustrate use of mobile devices to access content

Group	Terms
Subjects	courses, modules, topics, units, work
Resources	CDs, DVDs, documents, lecture notes, information
Readings	booklets, learning guides, study guide, textbook, unit booklets
Everything	all, another, something, stuff, things
Institution's website	apps, JCU website, my.TAFE, net, online
Other websites	ancestry.com, Facebook, Google, internet, YouTube
Web-conferencing	Collaborate sessions, Elluminate sessions, online class, online tutes, recordings

One particular aspect of content usage mentioned by Queensland students was web-conferencing, which is considered in Emergent theme 2.

6.1.2.2 Emergent theme 2: Participants use mobile devices to access content through web-conferencing and recordings of these, and expect to continue so to do.

Web-conferencing is a live video conference through the internet. Participants all see the same screen. They can interact by texting and talking. AnTEP does not use web-conferencing, and so none of the South Australian participants mentioned it. RATEP uses web-conferencing for (among other things) providing lectures. TAFE used Elluminate and Collaborate programs but in 2016 switched to Adobe Connect; JCU continues to use Collaborate. Seven of the 11 RATEP students (64%) in very remote communities in Queensland and 12 of the 19 RATEP students (63%) from Other sites commented on web-conferencing. This is a major feature of RATEP.

These first two Emergent themes have focused on content related uses of mobile devices.

6.1.2.3 Emergent theme 3: Participants use mobile devices to handle administration, and expect to continue so to do.

Institutions and students have various rights and obligations towards each other. Practical details involve matters such as outlining course requirements, assessment details (e.g. due dates, lodging of assignments), requests for extensions of time, notifications of absence and travel for residential courses. These have been organised by print, postal service, telephone calls and emails. This research investigated current and desired practice about the use of mobile devices for administrative purposes.

Participants identified three main administrative uses of mobile devices, including students checking notices and contacting staff of their course provider, and institutional staff contacting students. Seven of 11 RATEP students (64%) from very remote communities and 17 of 19 RATEP students (89%) from Other sites indicated they were using mobile devices for administrative purposes. Of the four areas of use of mobile devices for educational purposes, this is the only one currently used by very remote participants from South Australia. Four of 15 AnTEP students (27%) and five of 19 AEWs (26%) from South Australia made comments about administration.

6.1.2.4 Emergent theme 4: Participants use mobile devices for personal encouragement, and expect to continue so to do

Personal encouragement focuses on the emotional, social and physical status of the individual within the complex roles and responsibilities he or she holds. This includes health, sickness and injury, family and intimate relationships, community involvement and psychological and mental health issues.

The majority of RATEP participants from both very remote communities in Queensland and Other sites described using mobile devices for personal encouragement: 64% and 58% respectively of participants made comments to this effect. No participants from very remote communities in South Australia reported current usage. Personal encouragement uses of mobile devices were more common between student peers than between students and staff. The most popular uses were general conversation and the identification of an online community.

6.1.2.5 Emergent theme 5: Participants use mobile devices for academic support, and expect to continue so to do.

Academic support has been provided through support teachers at the learning centres, telephone calls to individuals, group telephone conferences, group video

conferences, feedback on assignments, and emails. This research investigated current and desired practice about the use of mobile devices for academic support purposes.

RATEP students in Queensland were using mobile devices for academic support, and desired to continue doing so: six of the 11 (55%) in very remote communities and 14 of the 19 (74%) from Other sites provided responses. Even though South Australian participants were not using mobile devices for this reason, three of 15 AnTEP students (20%) and four of 19 AEWs (21%) referred to the possibility. Academic support uses of mobile devices were more common between student peers than from staff to students.

6.1.3 Vignettes from participants

6.1.3.1 Content

One person who lived in a community without mobile network services expressed her frustration at having a mobile device and wanting to continue study using the internet after the learning centre had shut, but not being able so to do:

> Like when I'm here [in the learning centre] and doing my module and its [the school hours are] finished and when I go home and I sit there and I think "Hey I want to finish my module." *Tjinguru* [~ perhaps the] easy way [to study] ... like, they should put the internet here. Cause I have my iPad like this, and I want to work. (Participant 5, 856–865 + 886–890)

This person (who was an AEW at a very remote community without mobile network service) said that study material can be stored on mobile devices, through software and apps, and so is easily accessible as it does not require internet coverage:

> You can put Windows and stuff on to an iPad or mobile device that lets you and you still can study. You still have everything on there. If you had an app or something that was able to work without internet use, you're still able to use it. (Participant 64, 148–150)

This person was excited to realise she could use her mobile phone to participate in web-conferences while she was working as a cleaner. This points to the demands of combining work and professional study:

> Maybe I could do my Elluminate from my phone because I can't work on Fridays at the moment because of the Elluminate sessions. It would be cool if I could access it from my phone and I could just do it from work. (Participant 30, 414–416)

Another student emphasised the advantage she had over people without mobile devices because she could access resources at her convenience. This quote demonstrated how mobile devices empower agency through freedom of place and flexibility of time:

> [I have an advantage] in a sense of mobile devices and the technology that I use[ ] to make life easier myself, that I can access things. I don't have to wait till Monday morning to come in to RATEP, I can do stuff at home on the weekend. (Participant 13, 440–446)

6.1.3.2 Administration

In this quote the pre-service teacher indicates the quasi-corporeal nature of mobile phones, the immediacy of dealing with administrative matters while away from the learning centre and the benefit this is to her:

> It's always with me in my hand. OK, like, if I'm out somewhere and about and not at home, and where I could have access to my laptop and see things through there, but if I get a phone call that I need to do something like go online, you know, it's right there in my hand and I just use that. Yeah very quickly and it's like, helpful. (Participant 32, 89–97)

Another woman stated that the use of a laptop was a benefit and she had an advantage over other students. She said she would feel uncertain of how to pursue her studies if she did not have one:

> I do rely on it [my laptop], because I also use it to check up on my results on the TAFE site and all the rest of it, so yes. I think I would feel a bit lost without it. … Yes, I think it is a benefit to have your own laptop or have access to a laptop that you can have at home. It is a very good ... it is a much higher advantage, because like I said, you can do your Elluminate sessions, check up on your results. (Participant 18,87–98)

This person suggested ITE providers could invent an app for mobile devices that kept track of a student's progress through the course:

> If there was a way to show like an app for AnTEP … and show them how to use it on their iPad. … I reckon it would be easier and in the future, if they do Band One, it would be easier with the new levels. … I'm just saying if they have new levels maybe, [the app would make it] easier to see which stage you might be at, and what certificates you might be up to in teaching and all that. … Because you know how everything's all new, and everyone's got the iPad thing going. (Participant 62, 371–399)

6.1.3.3 Personal encouragement

One student claimed it was a necessity to have a mobile phone and share stories and gossip through social media:

> It's SO important, a necessity in life to have that $30 phone and zero dot Facebook, for like people who, you know, who don't have incomes at all; and that's all they need to share their stories or gossip [emphasis in original]. (Participant 7, 2221–2223)

This student described the way others cared for his welfare when he faced grief and praised him for his community and cultural activities, by keeping in touch through mobile devices:

> I kept in touch with [other students around the state]. … We always see how we're going. … All of them [are] on Facebook, so like you know they see like ... a family member has passed away like you know, they'll see how I'm going or ... if like I'm doing … 'cause I'm pretty busy in the community: I'm always doing stuff for, I work with the [rugby team] and all that … do a dance and stuff, and they'll see I'm doing something good like you know, they'll congratulate me. (Participant 23, 221–234)

One person mentioned posting general information about a group of students and that this would be an encouragement to them, and also an inspiration to others to commence similar career training.

> You could always have a Facebook page and stuff on it there for the group, and also updating what's happening. Like … In April at [community name] this is what's happening with the AnTEP group at the school. This is what the AnTEP group in [community name] has done, this is what they're up to altogether. They're almost completing. And stuff happening. … updating others on it. Once everybody does this … from you start when you're a young age until you're old … you see something that somebody does … and you're going: "Oh I want to be in that position, I would like to be in that position right now". So it gives someone more encouragement as well and gives them a boost as well. So if you have a social media site like Facebook or something like that … other Aboriginal people or Torres Strait Islander people are doing AnTEP and they saw this group of Aboriginal people or Torres Strait Islander people have done this and this is where they're **at** … like "I wish I could do that" … it encourages them a lot [emphasis in original]. (Participant 64, 282–296)

6.1.3.4 Academic support

These two quotes indicate the spontaneous communities of learning provided through mobile devices:

> I use it [a mobile device] now 'cause I've got, like a lot of my friends are on Facebook, so we've integrated through Facebook and then if I'm having issues with something I'll put it on, maybe write a couple of my friends, say, "Hey, have you guys done this, this unit? If so, where are yous at? I'm having troubles with this task. Are yous up to there?" And we communicate that way and via email. (Participant 13, 268–274)

> They all get on to Facebook when they're collaborating with each other and exchanging ideas. … I wouldn't mind if it were at a Coffee Club and you'd have your mobile devices and you were sitting down and you were Facebooking other students to get support in regards to assignments. … 'Cause I know that when I presented some of my work some of the students have said, "Oh you should look at this particular literature", and they've sent it through to me. And so it's been really good in that respect. (Participant 9, 246–280)

One AEW at a very remote community without mobile network service could foresee the benefits of collaborative academic support through mobile devices:

> [We could use mobile devices for] study uses and stuff. … So if there's something that you don't know, or it looks a bit confusing and it's not really [clear] ... [you] don't really understand it, then you could use it [a mobile device], send it to somebody. If you had a [Facebook] group then

> everybody would see it. So you could like [write] “Anybody know what number 3 is? It’s kind of confusing, I don’t really get it, so could somebody help me?” Something like that there I reckon. (Participant 64, 268–281)

6.1.4 Overview of findings from Research Question 1

The key finding from Research Question 1 is that the majority of participants (40 of 64, or 63%) indicated they use or would use at least one of the four educational uses of mobile devices, viz: content, administration, personal encouragement and academic support. This was the case in both very remote communities and Other sites. RATEP uses an online approach to study, and these students took the initiative to integrate mobile devices into their professional learning. AnTEP does not use an online approach to study. Nevertheless, across all four categories there were responses from participants associated with AnTEP (either as pre-service teachers or as potential pre-service teachers) indicating an intention to use mobile devices for educational purposes. These included comments from participants who did not have mobile network services in their communities. There is the expectation that using mobile devices for educational purposes will continue for those already doing so, and there is a desire so to do by those who have not yet begun.

6.2 Research Question 2 – Andragogical methods

> In what ways are andragogical methods affected by the use of mobile technologies in the delivery of ITE to Aboriginal and Torres Strait Islander pre-service teachers in very remote communities?

Three of the interview questions asked about the delivery of the course and the nature of learning:

> IQ 4. How do you think the university might change the way it delivers your ITE training if you used mobile devices?
>
> IQ 8. What are the ways you think that mobile learning is different from the ways you have been using so far for your ITE study?
>
> IQ 11. How would using mobile devices for your ITE study be different from what you are doing now?

6.2.1 Major finding

The key finding from Research Question 2 is that the use of mobile devices enhances andragogical methods in the delivery of ITE to Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. This is evidenced by 43 of the 64 participants (67%) in the collection of qualitative data mentioning at least one aspect in which the use of mobile devices is currently facilitating or could potentially enable

them to be self-directed in their learning regarding time or place of study. These two ways of using mobile devices are fully explained in section 6.2.2, along with additional aspects of andragogical issues. However, in brief, “time” refers to uses of mobile devices outside the operating hours of the tertiary learning centre in a community, and “place” refers to uses of mobile devices in other locations apart from inside the learning centre. This finding aligns with the work of Zepeda, Parylo and Bengtson (2014, pp. 300-301) who identified “five major characteristics of adult learning. … Adult learning is self-directed, motivational for the learner, problem centered, relevancy oriented and goal oriented”.

Table 6-10 presents data about the number of respondents who use or desire to use mobile devices for each purpose. The number of respondents varied for the two areas, hence a third column is included to indicate the total number of respondents who indicated any of the two ways in which usage of mobile devices facilitates them to be self-directed in their learning.

Table 6-10 Uses of mobile devices for self-directed learning regarding time and place by number of respondents

Sample	**Uses of mobile devices for self-directed learning, by number of respondents**		
	Time	Place	Any
64	41	42	43

6.2.1.1 Analysis by cohorts of participants

6.2.1.1.1 Very remote ITE students

Table 6-11 shows the responses of AnTEP students (N=15) and RATEP students (N=11) from very remote communities. The overall finding from Research Question 2 is that the majority of pre-service teachers in very remote communities (16 of the 26 participants, or 62%) indicated that the use of mobile devices helped them to be self-directed in their learning regarding time or place of study.

Table 6-11 Uses of mobile devices for self-directed learning regarding time and place by number of very remote respondents.

Cohort	**Sample**	**Uses of mobile devices for self-directed learning, by number of respondents**		
		Time	Place	Any
AnTEP	15	6	6	6
RATEP - VR	11	9	10	10
Combined	26	15	16	16

The data for pre-service teachers in very remote communities shows that 91% (10 of 11) of RATEP students and 40% (6 of 15) of AnTEP students are currently using or

have a desire to use mobile devices to assist them to be self-directed in their learning regarding either time or place. A Chi-Squared Test shows the difference in percentage is significant (χ^2 (1)=6.95, p=0.01). This is because most AnTEP students (13 of 15) come from communities without mobile network service, and so are unable to use all the capabilities of mobile devices to be engaged with study outside the times and walls of the learning centre in their community. Nevertheless, almost half of the AnTEP pre-service teachers valued the use or potential use of mobile devices to choose when and where they did their study.

The evidence from the majority (62%) of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities shows that the use of mobile devices enhances andragogical methods in the delivery of ITE to this cohort, as it facilitates their decision-making as adults about priorities in their lives and enables them to be self-directed in their learning.

6.2.1.1.2 ITE students from Other sites

The overall finding from Research Question 2 is that nearly all of the pre-service teachers in Other sites (18 of the 19 participants, or 95%) indicated that the use of mobile devices helped them to be self-directed in their learning regarding time or place of study. Table 6-12 shows data about RATEP students from Other sites.

Table 6-12 Uses of mobile devices for self-directed learning regarding time and place by number of respondents from Other sites

Cohort	**Sample**	**Uses of mobile devices for self-directed learning, by number of respondents from Other sites**		
		Time	Place	Any
Other sites	19	18	18	18

A Chi-Squared Test showed there was a significant difference between ITE students from Other sites and ITE students from very remote communities (χ^2 (1)=6.55, p=0.01), with respect to the use of mobile devices enabling them to be self-directed in their learning regarding either time or place (based on the “Combined” figure for “Any” from Table 6-12).

However, when the data is separated into the two groups (RATEP and AnTEP), a more nuanced picture emerges. Chi-Squared Tests at 95% confidence level show no significant difference between RATEP students from Other sites and RATEP students from very remote communities about the use of mobile devices enabling them to be self-directed in their learning regarding both time and place. This lack of difference between the two groups of students in RATEP can be explained (as in 6.2.1.1.1) by the facts that these pre-service teachers are all studying the same course through RATEP, and all sites had mobile network service. Furthermore, it suggests that

regardless of remoteness of location, the use of mobile devices is seen as beneficial, as it enables adults to deal with the exigencies of life as well as pursue study. The significant difference between ITE students from Other sites and ITE students in both programs from very remote communities is not due to the RATEP very remote students.

Rather, it can be attributed to the AnTEP students. Significantly fewer AnTEP very remote students than RATEP students from Other sites made comments about the use of mobile devices enabling them to be self-directed in their learning regarding both time (χ^2 (1)=12.10, p=0.00) and place (χ^2 (1)=12.10, p=0.00). As in 6.2.1.1.1, this is probably because of the lack of opportunity on a daily basis for AnTEP students to use the full range of functions of mobile devices, due to the absence of mobile network services in most of the communities.

When considering RATEP students, there is no significant difference between very remote students and those from Other sites regarding the use of mobile devices for self-directed learning. This evidence supports my claim that usage of mobile devices to enhance andragogic approaches is not dependent on remoteness.

6.2.1.1.3 Anangu Education Workers

The key finding from Research Question 2 is that the use of mobile devices could enhance andragogical methods in the delivery of ITE to Aboriginal and Torres Strait Islander pre-service teachers in Very Remote communities. This is evidenced by 9 of the 19 AEWs (47%) mentioning at least one aspect in which the use of mobile devices could potentially enable them to be self-directed in their learning regarding time or place of study.

Table 6-13 presents data about the number of AEWs who suggested using mobile devices at alternative times and places than the learning centre. The respondents varied for each of these two areas, hence a third column is included to indicate the total number of AEWs who indicated either of the two ways in which usage of mobile devices could facilitate them to be self-directed in their learning if they commenced tertiary study.

Table 6-13 Uses of mobile devices for self-directed learning regarding time and place by number of AEW respondents

Sample	**Uses of mobile devices for self-directed learning, by number of AEW respondents**		
	Time	Place	Either
19	8	8	9

Despite not being current tertiary students, and the majority of them living in

communities without mobile network service (15 of 19, or 79%), almost 50% of AEWs stated an intention to use mobile devices at alternative times and places than the learning centre. As with Research Question 1, this indicates they see benefits to tertiary study by using mobile devices.

Chi-Squared Tests at 95% confidence level showed that significantly more ITE students than AEWs made comments about the use of mobile devices enabling them to be self-directed in their learning regarding time, place or for either category. The significant difference is to be expected for the same reasons as in 6.1.1.1.4: AEWs are not doing tertiary study, and most (i.e. 15 of 19) live in communities without mobile network service. Nevertheless, almost half of the AEWs could envisage benefits of using mobile devices with regard to time and place.

Chi-Squared Tests at 95% confidence level showed no significant difference between AEWs and 'Very remote ITE students' across each of the two ways of using mobile devices or for either of the two uses. This lack of difference between the two groups is surprising. Very remote ITE students could be expected to use or intend to use mobile devices at alternate times and places from the learning centre more than people who were not studying. Again, this unexpected result can be explained by the fact that 'Very remote ITE students' is a composite entity, and that the low level of use by AnTEP students skewed the data for the combined group.

Chi-Squared Tests at 95% confidence level showed no significant difference between AEWs and AnTEP students regarding comments about the use of mobile devices enabling them to be self-directed in their learning, regarding time, place or either use. This result is unexpected, in that one might expect AnTEP students to have greater experience with using mobile devices for educational purposes than AEWs. The lack of difference occurred because AnTEP does not use online learning, so neither AnTEP students nor AEWs have experience with using mobile devices. In regard to time, place and either use, more AEWs (by percentage) offered comments than did AnTEP students, despite not being tertiary students. In both groups people could see the benefits regarding time and place of using mobile devices.

6.2.1.2 Analysis by characteristics of participants

6.2.1.2.1 Presence of mobile network service

The key finding from Research Question 2 is that nearly all participants (92%) from sites with mobile network service indicated that use or potential use of mobile devices enabled them to be self-directed in their learning regarding time and place, whereas at sites without mobile network service, 36% of participants provided

responses. Table 6-14 provides information about self-directed learning regarding time and place by mobile network service.

Table 6-14 Uses of mobile devices for self-directed learning regarding time and place by mobile network service, by the number of participants

Mobile network service	Sample	Uses of mobile devices for self-directed learning, by number of respondents		
		Time	Place	Either
Absent	28	9	9	10
Present	36	32	33	33

Chi-Squared Tests at 95% confidence level showed significantly more participants living in locations with mobile network service than those without services made comments about the use of mobile devices enabling them to be self-directed in their learning regarding time, place or either. This is not surprising and can be explained as in 6.1.1.2.1.

6.2.1.2.2 Gender

The key finding from Research Question 2 is that all male participants (100%) indicated use or potential use of mobile devices enabled them to be self-directed in their learning regarding time and place, whereas 62% of females provided responses. Table 6-15 provides information about self-directed learning regarding time and place by gender (male/female).

Table 6-15 Uses of mobile devices for self-directed learning regarding time and place by gender, by the number of participants

Gender	Sample	Uses of mobile devices for self-directed learning, by number of respondents		
		Time	Place	Either
Male	9	9	9	9
Female	55	32	33	34

Chi-Squared Tests at 95% confidence level showed males made significantly more comments than females about the use of mobile devices enabling them to be self-directed in their learning regarding time, place or either. This is surprising, as Aboriginal and Torres Strait Islander young women have been noted as high users of mobile devices. As cited earlier, Kral (2014, p. 7) observed that “young women especially are typically in ‘perpetual contact’ … through Facebook on [I]internet-enabled mobile phones”. She also stated that “young women [are] ‘looking for love’ through the phone or on Facebook, oftentimes by uploading provocative photos or ‘selfies’” (Kral, 2014, p. 13). It is possible the difference in this data may be

explained by the small sample for males, where one respondent accounts for 11% of the sample.

6.2.1.2.3 Age

The key finding from Research Question 2 is that the majority of both younger participants (76%) and older participants (64%) indicated that use or potential use of mobile devices enabled them to be self-directed in their learning regarding time and place. Table 6-16 provides information about self-directed learning regarding time and place by age.

Table 6-16 Uses of mobile devices for self-directed learning regarding time and place by age, by the number of participants

Age	Sample	Uses of mobile devices for self-directed learning, by number of respondents		
		Time	Place	Either
<25	17	12	12	13
25+	47	29	30	30

Chi-Squared Tests at 95% confidence level showed no significant difference on the three comparisons (i.e. time, place or either) between younger and older participants. This is unexpected, as “Indigenous youth are fast adopters of mobile technology” (Joint Select Committee on Cyber-Safety, 2013, p. 3), and the main users of mobile devices in remote Aboriginal and Torres Strait Islander communities (Dyson & Brady, 2009; Tangentyere Council & Central Land Council, 2007). Given these remarks in the literature, one might expect younger people to have provided significantly more comments than older participants. The lack of difference indicates that regardless of age, these tertiary students saw similar benefits about self-directed learning for tertiary study through the use of mobile devices.

6.2.2 Emergent themes in findings from Research Question

6.2.2.1 Emergent theme 1: The use of mobile devices enables adults to be self-directed in their learning by choosing places of study

Both community-based ITE programs were designed around the use of a learning centre in the community, usually at a school or TAFE site, with students expected to use the facility for their study. Some AnTEP sites have closed, yet there are still enrolled students in those communities. RATEP has commenced accepting off-site students. This research investigated current and desired practice about the use of mobile devices regarding places for study.

Eight alternative places for study apart from the learning centre were identified: home, anywhere, meeting, residential course, outside, at the institution, in school classrooms

and while on excursions. Participants from both very remote communities and Other sites believe the use of mobile devices enables them to be self-directed and have control over where they choose to study. The ability to work at home and “anywhere” were the two most common responses. Participants are not limited only to the learning centre. Rather, they believe the use of mobile devices provides freedom about the places they can study.

6.2.2.2 Emergent theme 2: The use of mobile devices enables adults to be self-directed in their learning by choosing times of study

As indicated in Chapter 2, when describing community-based ITE programs, most tertiary learning centres are located within schools or TAFE facilities. Many study tasks are performed on internet-enabled desktop computers in these learning centres. The operating hours of the learning centre usually match those of the school or TAFE, for example 8.30 a.m. to 4.00 p.m. Before and after business hours, the school or TAFE is locked and tertiary students generally do not have keys to access the learning centre. Students who also work part-time or full-time might only be able to use the site occasionally or perhaps not be able to access the learning centre at all during business hours. This research investigated current and desired practice about the use of mobile devices regarding times for study.

Eight alternative times for study apart from the opening hours of the learning centre were identified: at home, night, after hours, weekend, residential course, spare time, in the morning and during school holidays. Participants from both very remote communities and Other sites believe the use of mobile devices enables them to be self-directed and have control over when they choose to study. Participants pointed out that if ITE students study only when the learning centre is open, then their time for study is limited. The ability to work at home (as a proxy for “outside the business hours of the learning centre” or “when I’m not able to attend the learning centre”) and at night were the two most common responses. Participants are not limited only to the operating hours of the learning centre. Rather, they believe the use of mobile devices provides flexibility about the times they can study.

6.2.2.3 Emergent theme 3: The use of mobile devices enables adults to exhibit self-direction in their learning by choosing to temporarily give priority to other matters rather than study at the learning centre

Participants mentioned various issues that interrupted study, to which they had to give priority for a temporary period. This research investigated current and desired practice about the use of mobile devices regarding interruptions to study. Eleven kinds of interruptions were identified: employment, health, home life, mourning, sport, religious activities, cultural activities, pregnancy, domestic violence, other people using drugs

and visitors. Given the high incidence of incarceration of Aboriginal and Torres Strait Islander people, it is surprising that attending court with relatives or visiting relatives in prison were not mentioned.

Of the 64 participants, 40 (63%) mentioned at least one matter that took priority over study. In this circumstance, people may choose to temporarily not attend the learning centre or choose to cease study. This suggests that handling interruptions to study is a major feature of these students' lives, particularly for very remote participants, who had higher numbers of responses overall, and particularly for the following matters: employment, health, home life and religious activities. Participants believe the use of mobile devices enables them to continue study while handling extra demands in some situations and empowers them to accelerate their pace of study when returning to study after a break.

6.2.2.4 Emergent theme 4: The use of mobile devices motivates adults to engage in learning

This research investigated perceptions and practices about the use of mobile devices to motivate these participants to engage in study. Participants identified nine categories of terms describing the appeal of mobile devices: easy, good, helpful, it does everything, fun, new, always at hand, flexible and quick. The first three categories were the most common. South Australian participants frequently used terms in the easy group, despite only one of the five communities having mobile coverage.

6.2.2.5 Emergent theme 5: The use of mobile devices enables adults to solve learning problems

It is likely that students will encounter a difficulty in understanding some aspect of their course. This research investigated perceptions and practices about the use of mobile devices to solve learning problems. Seven categories of terms about problem solving through the use of mobile devices were identified by participants: use of time, use of device, use of the internet, access to classes, access to the course, communication, and functionality of the device. The first three terms were the most popular, which suggests participants view the use of mobile devices as helpful as the device itself is constantly with them; they can use it instantly, and it provides access to the internet. Twenty-six of the 64 participants (41%) made comments about problem solving using mobile devices.

If the number of participants who talked about the use of mobile devices for academic support is combined with those who mentioned the use of mobile devices for problem solving in this section, and people in both groups are only counted once, then 35 of 64 (55%) of participants see the use of mobile devices as beneficial in solving

problems related to their professional learning in a tertiary degree, both in general terms and also in regard to academic support.

6.2.2.6 Emergent theme 6: The use of mobile devices enables adults to complete tasks relevant to their professional learning

All the preceding findings indicated that the use of mobile devices is relevant to these adult learners. Ten categories of educational tasks were identified for which pre-service teachers found mobile devices relevant to their professional learning: complete assignments; organise yourself; manipulate files; format material; locate content; create different kinds of files; capture data; participate through looking, listening, speaking and drawing; search the internet; and access the course provider's website. These did not include general matters previously mentioned such as sending and receiving emails, texts/SMS, social media messages or phone conversations, nor participation in web-conferences.

Across both cohorts the top two tasks mentioned were searching the internet and working on assignments. The next four tasks were submitting assignments, watching material, typing and accessing the provider's website. These six tasks are fundamental to any online course, and the ability to successfully perform them on mobile devices makes mobile devices highly relevant to tertiary students. None of the South Australian participants used mobile devices for these tasks, as AnTEP was not an online program. However, 29 of 30 RATEP participants (97%) used mobile devices for at least one of these tasks. This high figure, along with findings already mentioned in both Research Questions 1 and 2, indicate that adult students used mobile devices because they are relevant to their tertiary study.

6.2.2.7 Emergent theme 7: The use of mobile devices enables adults to achieve their goal of gaining a tertiary qualification to enhance their career

The key research participants were Aboriginal and Torres Strait Islander pre-service teachers living in very remote communities and enrolled in community-based ITE programs. Other participants were pre-service teachers in RATEP from Other sites and AEWs who potentially could enrol in the AnTEP course. The problems underlying the research were the low completion rates in the two community-based ITE programs examined and the below parity level of Aboriginal and Torres Strait Islander school teachers and leaders nationally and particularly in very remote communities. The research focused on how the use of mobile technologies might enhance the professional learning of the participants. This research investigated perceptions about the use of mobile devices contributing to the goal of completing a qualification leading to registration as a school teacher.

Twenty-seven terms were sorted into two categories: complete and goal. For both very remote participants and students from Other sites, the top way in which mobile devices assisted was by facilitating completion of the course. None of the South Australian participants specifically linked use of mobile devices with the aim of completing a qualification. However 16 of 30 RATEP participants (53%) believed the use mobile devices contributed towards this career goal.

6.2.3 Vignettes from participants

6.2.3.1 Multifunctionality and interactivity

One person commented on the way mobile devices can be used for many purposes:

> You see people living out of their phones these days. You know, it's everything: it's their calendar, it's their diary, its their everything! … I guess if I didn't have the [desktop] computer and I needed to go down to the park or something and interview people, I guess it would come in handy and you'd have your mobile or whatever device there, could record voices, video footage, cameras, could research, you know, if I needed to Google something I could Google something. (Participant 13, 60-61 + 1117–1121)

Another student suggested that touch screens make mobile devices more personal, interactive, flexible, easier and more enjoyable to use:

> I reckon it is a help because it gives you a bit of flexibility. Like I said earlier, when I am on a desktop computer trying to look up say, maths homework or whatever, I can't do it, but if I sit out here on the iPad, it's easy for me and it's also interactive. So with the iPad … I could just use my finger to move the transformation. … its more hands on; and to me, I find if you're doing something that's hands on, like hand–eye coordination it, yeah, it sticks in your head. … I think that's why smartphones are so popular, because its touch screen. So touch screen – that it's personal to you. Well that's how I feel anyway. The desktop feels more professional, professional – sort of like an object; but this is like a personal, personal thing, anyway. … Well I honestly just think that mobile devices are just easier – oh, make everything easier! Like more access to things, in more comfortable settings, to what you're comfort to … yeah ENJOY it really! It's personal [Emphasis in original]. (Participant 7, 726–754, 787–796, 1659–1664)

6.2.3.2 Time

This woman suggested using mobile devices at night, instead of during school hours:

> We like to do our thinking *mungangka ngayulu kulilpai* [~ at night is when I think]. We should have our own phone from AnTEP to play around, 'cause some of its not finished, it's still there … [I'm] thinking I should, we should finish it at home [after others have gone to sleep]. (Participant 2, 1078–1110)

This person had a part-time job and was a full-time student; she emphasised how it was beneficial for her to use a mobile device at home after hours:

> I do have a laptop at home which I do use a lot after hours. … but I use that at home and log in through there, from home, through to university and do all my work from there. ... it depends on your workload. … So then I take a lot of work home, like assignments. I have online tutes and sessions that I need to catch up with and quizzes. And it's a lot of work. (Participant 31, 42–52)

Similarly, this student worked full time, and studied part time as well; she stressed the importance of using a mobile device to study into the early hours of the morning:

> [I use my laptop for study at home] every night until about 3 o'clock in the morning! And any spare time that I've had. But quite often I was up to 1 or 2 o'clock in the morning doing my study. (Participant 25, 64–65)

6.2.3.3 Place

This student was enthusiastic about having internet access on her mobile device wherever she went:

> My iPad – I can carry it anywhere and access it anywhere, which is pretty good. … If I'm sitting outside or if I'm sitting down the beach with an iPad, I can have exactly the same access. … You can have access to the internet wherever you go! That's what I love about it! (Participant 31, 138–139, 298–299, 302)

One student talked about using her mobile device for study at a park:

> I can get on my iPad anywhere and still … like at the park, and still just get into JCU sites, still do some reading, still listen in. So yes, it's pretty good in that way. It's flexible wherever you are you can listen to it and keep up to date with it all. (Participant 14, 90–93)

Another student said that studying with a mobile device in a tranquil place like a beach gave her deeper understanding:

> If I had a laptop I could choose anywhere I'd like to study. I think sometimes if you can put yourself in a place, that's, very, very tranquil where you can allow your mind to free associate, you'll find that you'll get more clarity. Yeah I think being stuck in four walls it can have its limitations. I think sometimes, I know when I've had, you know, that light, that light bulb moment, it hasn't been (laugh), it hasn't always been in the classroom! It's been you know, when you're sitting down on the beach, relaxing, and you're taking in everything, and suddenly, I think because you're in a relaxing environment it tends to stimulate you a lot easier I think. Because you're not, you're not, you're not feeling overwhelmed, and tense to perform. You're actually in an environment that's calmed you down and allowed you to, allow your thought processes to develop more readily, you know, like, not cramped I suppose. (Participant 9, 478–498)

This person talked about using a mobile device away from her community, when on country:

> I think the difference about [a mobile device] is that because it's portable. You have access to be able to do that while you're doing other things, like bush trips. (Participant 64, 145–148)

This person had a leadership role in a school and mentioned using mobile devices for presentations in meetings:

> We can use it [a laptop] for meetings; you know like learn to use the … what's that thing? – you put into big screen? and using it in the meetings? yeah picture projector, and all these stuffs so we can have a PowerPoint and all that. (Participant 3, 448–461)

6.2.3.4 Health

This person said that if she had not had a mobile device when she was injured, she might not have been able to complete the course:

> I had a broken ankle for quite some time and couldn't come in. So I just used mine at home. I could go through my.TAFE and access the same thing. [If I did not have a laptop] I would have struggled. I wouldn't have been able to (probably) complete the course, or fallen well behind, because I wouldn't have been able to get to TAFE to this RATEP office to complete my course. (Participant 25, 55–60)

6.2.3.5 Parenting

Another person pointed out that with a mobile device she could combine study and taking her child to sport:

> When I take my son to football training, he'll be out on the field and I can be sitting there doing my study [on my iPad]. … And that's when I catch up. (Participant 14, 95–98)

In this quote the student talks about the convenience of using a mobile device for study when having to look after sick children:

> Especially if an emergency happens like you said before, if my children get sick and I have to stay home, it's so much more convenient to have a laptop than to be worried about running in and out [to the learning centre]. (Participant 18, 99–102)

6.2.3.6 Domestic violence

One woman explained that she relocated to get away from the perpetrator of domestic violence. She assumed she could continue study with a mobile device, but experienced technical difficulties so withdrew from study. Since then, software manufacturers have issued upgrades and the institution has updated its systems. Thus, such technical problems should not now prevent a person in a similar situation continuing with study.

> I've experienced a lot of domestic violence at the start of the year. So that caused me to go up to [name of town], stay at the Women's Shelter up there. Now that was *really* hard for me because, my sister had a[n] iPad and I took it with me, 'cause I was like "Oh yeah, I can still do everything because of the way the course is delivered, is you know, online". So I was like "Oh yeah, I can still do everything. I can go, you know with JCU: Blackboard, Collaborate". But then every time I tried to jump on to a Collaborate session it wouldn't let me. And I'm like "What's wrong?!" and I'm always ringing, like messaging my lecturer, I couldn't get on [because of] technical difficulties, and then when I was up there it was just too hard to keep up to date. (Participant 7, 232–251)

6.2.3.7 Funerals

Another student said that mobile devices enabled a person to continue studying when away from the home community for a funeral:

> It's more convenient to have the mobile devices because … you can do things if you had to go away or something ... a funeral or some family business ... you could actually take your stuff with you and do it wherever you are. You don't have to rely on actually coming into the [learning] centre all the time. (Participant 18,139–143)

6.2.3.8 Cultural activities

This person stated the importance of participating in cultural ceremonies, known as "business" and pointed out that if a person did not have a mobile device they might not be able to continue with study: "So Anangu way … just, you know, people got to travel on business, funeral and all … sometime you miss out [if you don't have a mobile device], see, and then you can't finish off doing AnTEP you know" (Participant 36, E33 1323–1324).

6.2.3.9 Sport

This woman mentioned several issues that interrupt study, including travelling for football matches to other communities, and implied that use of a mobile device would assist in keeping up with study commitments: "Anangu … we've got problems like families, business, football and kids sick and that's why it's hard for my families and we miss lesson" (Participant 41, 95–97).

6.2.4 Overview of findings from Research Question 2

The major finding from Research Question 2 is that the majority of participants (43 of 64, or 67%) indicated the use of mobile devices enhances andragogical methods in tertiary study, because such use enables them to be self-directed in their learning regarding time and place of study. Seven themes emerged from the data. The use of mobile devices enables adults to be self-directed in their learning by choosing times of study and places of study, as well as by choosing to temporarily prioritise other matters rather than study at the learning centre. The use of mobile devices motivates adults to engage in learning, solve learning problems, complete tasks relevant to their

professional learning and achieve their goal of gaining a tertiary qualification to enhance their career. The evidence shows that the use of mobile devices enhances the use of andragogical methods in tertiary study by Aboriginal and Torres Strait Islander pre-service teachers in both very remote communities and Other sites.

6.3 Research Question 3 – Rate of progress

> In what ways do Aboriginal and Torres Strait Islander pre-service teachers and Aboriginal and Islander Education Workers (AIEWs) in very remote communities think the use of mobile technologies could affect their rate of progress towards completion of an ITE qualification?

Two of the interview questions asked about the speed of progress and finishing study:

> IQ 7. How do you think having content material, administrative support, or personal encouragement by mobile devices would help you finish things more quickly?
>
> IQ 12. How could using mobile devices speed up the way you finish units or the whole ITE course, so you get a qualification and become a registered teacher?

6.3.1 Major finding

The key finding from Research Question 3 is that the use of mobile devices enables participants to finish their study faster. This is evidenced by 35 of 64 participants (55%) indicating this perception. This finding agrees with the claim that mobile technology "reduced dropout and increased completion" (Mishra, 2009, p. v). None of the participants suggested there would be no change to speed or that use of mobile devices would slow down the speed of progress; people either responded positively or made no comment. In effect then, of those who made a response, all indicated that the use of mobile devices facilitates speedy progress through their course. This is explained in section 6.3.2.

6.3.1.1 Analysis by cohorts of participants

6.3.1.1.1 Very remote ITE students

Table 6-17 shows the responses of AnTEP students (N=15) and RATEP students (N=11) from very remote communities. The finding from Research Question 3 is that almost half of pre-service teachers in very remote communities (12 of the 26 participants, or 46%) indicated the use of mobile devices helped to speed up their progress of study.

Table 6-17 Use of mobile devices to speed up progress, by number of very remote ITE respondents

Cohort	Sample	Use of mobile devices to speed up progress, by number of respondents
AnTEP	15	5
RATEP - VR	11	7
Combined	26	12

A Chi-Squared Test showed there was no significant difference between RATEP very remote students and AnTEP very remote students on views about the effect of use of mobile devices on speed of completion; both groups thought use of mobile devices enabled completion to occur quicker (χ^2 (1)=2.34, p=0.13). The lack of difference suggests that despite AnTEP students not using mobile devices for educational reasons, their experiences with mobile devices in other areas of their lives to enable matters to be handled speedily led them to believe the same would apply regarding tertiary study.

6.3.1.1.2 ITE students from Other sites

The finding from Research Question 3 is that the majority of the pre-service teachers in Other sites (16 of the 19 participants, or 84%) indicated they experienced and believed the use of mobile devices enabled them to complete study more quickly. A Chi-Squared Test showed that significantly more ITE students from Other sites than ITE students from very remote communities (χ^2 (1)=6.76, p=0.01) thought the use of mobile devices helped to speed up their progress in study (based on the "Combined" figure from Table 6-17).

However, as noted previously with Research Questions 1 and 2, when the data is separated into the two groups of very remote ITE students (RATEP and AnTEP), a more complex scenario arises. Chi-Squared Tests at 95% confidence level show no significant difference between RATEP students from Other sites and RATEP students from very remote communities. As indicated earlier, all RATEP students are studying the same course in the same mode. More than three-quarters of RATEP students (23 of 30, or 77%), regardless of location, believe use of mobile devices speeds up progress in their study.

The significant difference between ITE students from Other sites and ITE students in both programs from very remote communities is due to the AnTEP students. Significantly fewer AnTEP very remote students than RATEP students from Other sites made comments about the use of mobile devices enabling them to complete work more quickly (χ^2 (1)=9.19, p=0.00). AnTEP appears to permit great flexibility regarding time taken to complete components of the course. In 2012, one woman

graduated with a Bachelor of Teaching (Anangu Education) after 14 years (Holderhead, 2012); in 2013 another graduated after 19 years (Schriever, 2013). Thus, AnTEP students seem less concerned about their speed of progress than RATEP students from Other sites.

When considering RATEP students, there is no significant difference between very remote students and those from Other sites regarding the belief that use of mobile devices speeds up progress of study. This is further evidence supporting my claim that quicker completion of study through usage of mobile devices is not dependent on remoteness.

6.3.1.1.3 Anangu Education Workers

The key finding from the third research question is the use of mobile devices is seen as enabling participants to finish their study faster. This is evidenced by 7 of 19 AEWs (37%) indicating this perception. Despite not being current tertiary students, and the majority of them living in communities without mobile network service, almost 40% of AEWs indicated that they thought the use of mobile devices would speed up progress through a tertiary degree.

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and all ITE students in their comments about the use or perception of the use of mobile devices enabling them to complete work more quickly. The absence of significant difference is a surprise. It could be expected that because AEWs are not doing tertiary study, and most (i.e. 15 of 19, or 79%) live in communities without mobile network service, they would not be able to imagine the effect of use of mobile devices on speed of study. However, perhaps their general experiences with mobile devices in getting things done quickly led them to believe the same would apply regarding tertiary study.

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and very remote ITE students in their comments about the use or perception of the use of mobile devices enabling them to complete work more quickly. The absence of significant difference is a surprise. In contrast to AEWs who are not studying, very remote ITE students could be expected to know from their own experience of study what the actual and perceived impact of use of mobile devices is on speed of completion. Perhaps the unexpected result can be explained by the likelihood that the low level of use by AnTEP students negatively skewed the data for the combined group (see 6.1.1.1.1).

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and AnTEP students regarding belief of the effect of

using mobile devices on speed of completion. This result was not anticipated. Rather, one might expect AnTEP students to have greater experience with using mobile devices for educational purposes than AEWs. The lack of difference occurred because AnTEP does not use online learning, so neither AnTEP students nor AEWs have experience with using mobile devices for educational purposes. For both groups, their general experience with using mobile devices gave them a similar perception that educational tasks could be completed more quickly using mobile devices.

6.3.1.2 Analysis by characteristics of participants

6.3.1.2.1 Presence of mobile network service

Table 6-18 shows a comparison of participants' responses between places with and without mobile network service regarding the use of mobile devices to increase the speed of progress. The key finding from Research Question 3 is that three-quarters of participants (75%) from sites with mobile network service indicated use or potential use of mobile devices enabled participants to finish their study faster, whereas at sites without mobile network service, 29% of participants provided responses.

Table 6-18 Effect of use of mobile devices on speed of completion by mobile network service, by the number of participants

Mobile network service	Sample	Quicker
Absent	28	8
Present	36	27

Chi-Squared Tests at 95% confidence level showed that significantly more participants living in locations with mobile network service than those without mobile network service made comments about the use of mobile devices speeding up the time to complete work. This is not surprising and can be explained as in 6.1.1.2.1.

6.3.1.2.2 Gender

The key finding from Research Question 3 is that all male participants (100%) indicated use or potential use of mobile devices enabled them to complete work faster, whereas 47% of females provided similar responses. Table 6-19 provides information about the impact of using mobile devices on the rate of progress of study, by gender.

Table 6-19 Effect of use of mobile devices on speed of completion by gender, by the number of participants

Gender	Sample	Quicker
Male	9	9
Female	55	26

Chi-Squared Tests at 95% confidence level showed that significantly more males than females knew from experience or thought the use of mobile devices would speed up the rate of progress of study. This is not surprising and may be explained by the difficulties females have in completing qualifications in minimal time. Females need to interrupt study, take breaks and return to study at later times, due to the multiple demands on them, particularly with respect to pregnancy, child-rearing and home duties. Two examples were provided earlier (6.3.1.1.2) of AnTEP women who took 14 and 19 years to complete their degrees. Nevertheless, almost half the females had experience of or could foresee the way in which using mobile devices sped up their work.

6.3.1.2.3 Age

The key finding from Research Question 3 is that younger participants (59%) indicated use or potential use of mobile devices enabled them to complete work faster, and 53% of older participants said similarly. Table 6-20 provides information about the impact of using mobile devices on the rate of progress of study, by age.

Table 6-20 Effect of use of mobile devices on speed of completion by age, by the number of participants

Age	Sample	Quicker
<25 years old	17	10
25+ years old	47	25

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between younger and older participants. This is surprising, as young people are generally perceived as adept users of mobile devices, and so one might expect them to have greater experience of using mobile devices to finish their work faster. The lack of difference indicates that the ability to use mobile devices to speed up the rate of progress of tertiary study is independent of age.

6.3.2 Emergent themes in findings from Research Question 3

6.3.2.1 Emergent theme 1: Flexible use of time through mobile devices leads to increased time spent on study, which contributes to faster completion of tasks

The following theme emerged from the data: the perception of research participants is that use of mobile devices enables greater flexibility about times of study, which leads to the amount of time spent studying being increased, and this contributes to faster completion of tasks, and thereby the overall rate of progress towards a qualification is improved.

The data shows similar responses from participants regardless of location. In regard to increasing their rate of progress towards a qualification, seven factors were identified as common to both groups: people say that typing is quicker than writing by hand; using a mobile device cuts out travel time to the learning centre and so increases study time; having online resources accessible through a mobile device saves going to a library and searching for material; if the next topic is online, you can go straight on with it, rather than sitting waiting and delaying; if you have a mobile device, you can persevere with study in the midst of interruptions; if you have a mobile device, you can continue with study at night during residential weeks; and if you have a mobile device, you can do study at your own convenience, rather than only when the learning centre is open – for example, after hours, spare time, night, weekends and at home. People living in Other sites added four more: submitting assignments online before the due date from the mobile device rather than having to go to the learning centre; after interruptions or a break from study you can accelerate the rate of study and intensify your efforts if you have a mobile device; during school holidays the learning centre is shut, but if you have a mobile device, you can continue studying in those weeks; and administration can be handled quickly from a mobile device – you don't have to wait till you get to the learning centre.

A major point emerging from the data is that participants believe the use of mobile devices outside of the business hours of the learning centre enables them to invest time in study, thereby completing assignments before or at due dates. Both groups feel that due to the use of mobile devices in their study, their rate of progress has improved.

6.3.2.2 Emergent theme 2: Non-use of mobile devices hinders study and slows the rate of progress

Fifteen of 30 RATEP participants (50%) specifically remarked on problems with not using mobile devices, or noted the benefit of using mobile devices for study. They noted four problems if they were not able to use mobile devices: emotional distress

due to loss or damage to the device; difficulty in study; inability to complete their course; and unwillingness to enrol in study without a mobile device. Conversely, they suggested that use of mobile devices could prevent withdrawal from study. None of the South Australian participants made any comments on these matters.

6.3.3 Vignettes from participants

6.3.3.1 Immediacy of action

This person said that with mobile devices, matters can be dealt with immediately:

> You don't have to prearrange a time and wait for that time. You can deal with it straight away. You can immediately have contact with somebody to have a question answered, to organise something … to go and see somebody. It's convenience. It's just there. (Participant 25, 329–332)

This student talked about the spontaneous use of mobile devices to instantly confirm a thought that has come to mind:

> If you're using something like, like using your phone, you can just Google any information you want. Like if you're not in a library, and you happen to be in the park, and you had an epiphany all of a sudden or whatever, you can find out something that's happening … having a phone there, you can instantly Google and find out information that is you know, right there and then, on the spot. … And so it certainly does make life a hell of a lot easier. (Participant 9, 353–365)

This AEW from a very remote community without mobile network service suggested that access to the internet through mobile devices enables immediacy for study, and prevents delays:

> I think because it's portable, and also easy access for everything. If there's something on there … we're studying and there's something that we don't really understand, then you could flick over to the internet and look it up quickly, than doing it on paper and then going to either finding a book or going on to a desktop. At least you can do it and be comfortable. You can multitask with it as well. (Participant 64, 90–96)

6.3.3.2 Not waiting to be at learning centre

One woman expressed her anticipation about receiving results and how she could check these at night:

> For me personally, like for our administration, … I don't have to wait – I don't have to wait till I'm at RATEP to read my emails. … If I'm waiting for a mark back, I check – I just go to my inbox, any time of night. ... Refresh, refresh, refresh! (Participant 7, 1210–1216)

Another student said that by using a mobile device, she could study on her own terms – at home, at night and on weekends:

> In a sense [I have an advantage, because] of mobile devices and the technology that I used to make life easier myself, that I can access things – I don't have to wait till Monday morning to come in to RATEP … I can do stuff at home on the weekend. … It [using a mobile device] helps me a lot, because I can do stuff on my own terms at home when I like. If I can't go to sleep three o'clock in the morning, I can do my work, and I don't have to wait to come here. (Participant 13, 440–446 + 843–845)

In this quote the student speaks of the benefit of using a mobile device from home to submit assignments after the learning centre has closed for the day:

> To have that laptop or whatever thing at home, they wouldn't need to come, they could just submit everything there and then. (Participant 8, 703–704)

6.3.3.3 Own time

This student emphasised that using mobile devices at home makes the time shorter for completing assignments:

> It would definitely I think make it quicker. I'm an example for this because I do some work for the course on my laptop while the kids they're asleep at night. (Participant 6, 503–504)

This was reinforced by another student who compared herself and a friend who both had mobile devices, to a third person who did not have mobile devices:

> We've been finished … two weeks before everything is completed; and that's simply because we have access to these things [mobile devices] at our house or wherever we are. We've got that after-hours access that it makes easier for us. (Participant 13, 855–867)

In this quote the student asserts that using mobile devices speeds up the time to complete assignments:

> I did all my work at home on my own little mini laptop. So, so that's, I think it speeds up the process if [the learning centre has] a lack of resources; and certainly speeds it up if you [personally] have, you have access to other resources. (Participant 9, 598–612)

An AEW who had a school leadership role in a very remote community without mobile network service suggested people could study in spare time after home duties were done:

> But I believe if you want to speed up things quicker it's good to have homework to take, after school, back home when you've got to finish other duties at home, cleaning or whatever, washing and if you've got a spare time, and you've got tea on. Maybe after tea. (Participant 55, 555–560)

6.3.3.4 Travel

These students stated that using mobile devices at home redeems the time taken to travel:

> [The benefit of using mobile devices is] just the ease of accessing information rather than going to a library – it saves time. … You don't have to go to the library, you don't have to go anywhere; you've got it there with you where you can still continue wherever you are. (Participant 25, 84–88 + 230–232)

> I use it [my laptop] all the time and it is very essential to, to doing this course I think because also I have to travel to get here to this site. Like I said it's [the learning centre has] got [technical and internet] problems all the time so ... I can stay home. … It would slow me down a lot [if I did not use a mobile device] because, just the travelling. (Participant 19, 146–148 +158)

6.3.3.5 Sickness

One student referred to the issue of sickness and people being unable to attend the learning centre and their progress being delayed. She advocated that mobile devices could be subsidised to boost retention and completion rates.

> Too bad they're sick, then they stay home again. They don't come in and they lose a whole lot of work because they don't have [a mobile device] … If something like that could have been subsidised for students then you'd have all these students getting it and jumping on board and not failing and not wasting government's money and time on dropouts or you know on their courses are saying "Nah, don't want to do it anymore, 'cause it's too hard, don't have any time, and I keep failing my assessments". (Participant 13, 1034–1051)

6.3.3.6 Employment

This student pointed to the clash between employment and the opening hours of the learning centre. She emphasised that using a mobile device released her from the stress of trying to be in two places at once, and facilitated being able to study towards a degree:

> We're all working. [If we could not use mobile devices] that would really limit the opportunity to complete a Bachelor of Education. Just the extra stress of knowing that you had to get here [to the learning centre] within a set time frame to complete modules or assignments, or exams or whatever it is. So you've got the stress of having to complete that; but then you've got the extra stress on top of knowing you have to get here before five o'clock. [Not being able to use mobile devices at home] would just be additional stress that you probably didn't need. (Participant 25, 406–415)

Another student underscored the point that study would be difficult if she did not have a mobile device, and suggested she would not study if she could not use a mobile device:

> [If I didn't have a laptop] it would be very difficult for me [as I work in the day care]. Because I'd have to come into the site every day. I guess I wouldn't have the opportunity to do it [study for a teaching qualification]. Like mainly I do my studies when I can do some at night-time. I wouldn't be able to come in here and use the [desktop] computer at night-time. It would make it difficult for me [if I couldn't use my laptop]. (Participant 29, 103–106)

6.3.3.7 Perseverance

This woman highlighted the value of mobile devices to stop people dropping out of study, when their routine had been disrupted by various reasons, including funerals:

> Yes. Definitely [mobile devices could help people keep going]. They would still have access to the course, they would still have access to be able to keep in contact with other students and their teacher coordinator to help them stay focused. I suppose it's human nature if you're away from something for a couple of weeks for whatever the reason, you lose your routine, you lose your structure. Possibly even the interest for what you are doing, because you're falling behind and you know you've got extra work to catch up with. It can become overwhelming and possibly [people might walk away]. Yes. It's easier just to stop doing your course than to complete it. So really having a mobile device with you so you can still … you've still got that motivation there, you've still got something to access it, so it's not hard. (Participant 25, 215–230)

6.3.3.8 Accelerate the pace

This person said that after a major interruption to study, use of mobile devices meant a person could increase the pace of study, and catch up:

> But there's sort of times when you don't want to do stuff, and then there are times when you really do, and you can get through it quick. So you know, just times around death, and sickness for people really gets you down. But after that sadness, you might get a good run and get a lot of stuff done [using mobile devices]. … Yeah, you sort of put it [study] on hold, and then come back to it when you're ready. (Participant 6,513–544)

6.3.3.9 Academic support available

One student suggested that having academic support through mobile devices sped up the time to complete work:

> If you have all that support there [through mobile devices], really, really quickly, maybe it might improve how fast you get some things [done]. (Participant 9, 330–332)

6.3.3.10 Study difficult without mobile devices

Five of the eleven very remote RATEP students (45%) specifically indicated difficulties in study without the use of mobile devices. One woman said she would "be devastated" (Participant 32, 101) if her mobile phone was damaged. Another remarked that if she did not have a laptop "It would be very difficult for me. … I wouldn't have the opportunity to do it" (Participant 29, 103–104). Two others suggested they would be unable to complete a course: "I wouldn't have been able to (probably)

complete the course, or fallen well behind" (Participant 25, 57–59) and "I wouldn't be able to hack it without a laptop" (Participant 31, 257–258). Another woman indicated she would not enrol in study without a mobile device: "No, probably not, because it just would be harder, you'd have to do everything manually… yes it would be a lot harder" (Participant 26, 392–405).

Most of the participants from Other sites pointed to problems with study if they did not have mobile devices. One woman said she was "freaking out" (Participant 21, 199) when she lost her mobile phone. Another said she would "be depressed" and "lost without it" (Participant 18, 87–89) if her laptop got damaged. Several believed that not having a mobile device would disadvantage them – one said her study would be "a little bit more tricky" (Participant 15, 132) and pointed out, "If you are not set up in a way that can help you get to where you need to go to academically [such as having a mobile device], then that does make it a lot harder" (Participant 15, 144–145); another noted that not having mobile devices could mean they forgo specific online components of topics: "So without that laptop and using that Elluminate at home, I'd miss out on those sessions, and that would make it a lot more difficult" (Participant 6, 230–234); one stated bluntly, "If I didn't have my laptop, I would be up the creek" (Participant 19, 144).

One woman said that having got her own equipment, she would not countenance not using mobile devices again: "[If I could not use mobile devices], I wouldn't be studying" (Participant 24, 168). Someone else suggested that if previous students had mobile devices, they probably would not have quit study. "It would've made a huge difference … to have that laptop or whatever thing at home" (Participant 8, 702–707).

6.3.4 Overview of findings from Research Question 3

The key finding from Research Question 3 is that most of the participants (35 of 64, or 55%) believed that the use of mobile devices enabled them to work faster and complete study more quickly. Ten factors were associated with the overall perception of mobile devices facilitating increased rates of progress. The most frequently mentioned factor was that participants believe the use of mobile devices enables them to study when the learning centre is closed, and this speeds up their progress towards an ITE qualification. Participants also believed that lack of mobile devices hindered study, whereas the use of mobile devices could lead to improved retention and completion rates.

The following section presents data arising from Research Question 4, which considers aspects of Aboriginal and Torres Strait Islander cultural philosophies and possible alignment with the use of mobile devices.

6.4 Research Question 4 – Mobile learning and cultural philosophies

> How do features of mobile learning align with Aboriginal and Torres Strait Islander cosmology, ontology, epistemology and axiology?

As indicated in Chapter 3, the issue of culture was identified as an area requiring further investigation relating to the adoption of technology. Given that the participants in this research were all Aboriginal or Torres Strait Islander people, the matter of culture is particularly pertinent for this research. Section 3.5 provided a brief overview of cultural philosophies and looked at four terms: cosmology (views about physical and spiritual realities), ontology (perspectives on being and identity), epistemology (ideas of knowledge) and axiology (concepts of values and ethics). Transcripts of interviews were checked to identify each of these aspects of philosophy. Two of the interview questions asked about relationships between Aboriginal and Torres Strait Islander cultural philosophies and aspects of use of mobile devices:

> IQ 9. What do you think are the special cultural ways Aboriginal and Torres Strait Islander people look at life? (Prompts ~ views of (1) the universe – physical and spiritual realities, (2) identity/being, (3) knowledge, (4) values)
>
> IQ 10. Can you describe ways that using mobile devices match these Aboriginal and Torres Strait Islander views of life?

6.4.1 Major finding

There are two major findings from Research Question 4. The first is that cultural philosophies are important to Aboriginal and Torres Strait Islander people. This is evidenced by 52 of 64 participants (81%) mentioning at least one aspect of cosmology, ontology, epistemology or axiology. Table 6-21 presents data about the number of respondents who made general comments about cultural philosophies. This table excludes comments that were specifically linked to the use of mobile devices (which are shown in Table 6-22). The respondents varied for each of the four areas, so a final column is included to show the total number of respondents who offered at least one remark.

Table 6-21 General comments about cosmology, ontology, epistemology or axiology by number of respondents.

Sample	**General comments about cultural philosophies, by number of respondents**				
	Cosmology	Ontology	Epistemology	Axiology	Any
64	34	17	36	30	52

The second key finding from the fourth research question is that mobile learning expresses elements of cultural philosophies. This is evidenced by 53 of 64 participants (83%) making comments about the use of mobile learning that align, either positively or negatively, with at least one aspect of cosmology, ontology, epistemology or axiology. Table 6-22 presents data about the number of respondents who made comments linking cultural philosophies and the use of mobile devices. The respondents varied for each of the four areas, so a fifth column is included to show the total number of respondents who offered at least one remark.

Table 6-22 Comments linking cultural philosophies and the use of mobile devices by number of respondents

Sample	**Comments aligning cultural philosophies and the use of mobile devices by number of respondents**				
	Cosmology	Ontology	Epistemology	Axiology	Any
64	6	17	31	34	53

In order to further explore the aim of the research to discover ways in which the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities, this section will focus on the second key finding. Hence, the first key finding is simply noted.

6.4.1.1 Analysis by cohorts of participants

6.4.1.1.1 Very remote ITE students

Table 6-23 shows the responses of AnTEP students (N=15) and RATEP students (N=11) from very remote communities. The overall finding from Research Question 4 is that the majority of pre-service teachers in very remote communities (23 of the 26 participants, or 80%) linked the use of mobile devices with at least one aspect of cultural philosophies.

Table 6-23 Comments linking use of mobile devices with aspects of cultural philosophies by very remote ITE students in two programs, by number of respondents

Cohort	**Sample**	**Comments linking use of mobile devices with aspects of cultural philosophies**				
		Cosmology	Ontology	Epistemology	Axiology	Any
AnTEP	15	0	5	8	9	13
RATEP VR	11	2	4	8	2	11
Combined	26	2	9	16	11	24

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between RATEP very remote students and AnTEP very remote students regarding linking use of mobile devices and aspects of cultural philosophies, apart from in relation to axiology. AnTEP very remote students made significantly more

comments about axiology than RATEP very remote students: axiology (χ^2 (1)=4.55, p=0.03). The significant difference for axiology can be explained by the fact that very remote South Australian participants saw the issue of theft of mobile devices as a major problem, but this was not mentioned by very remote students from Queensland.

6.4.1.1.2 ITE students from Other sites

The overall finding from Research Question 4 is that the majority of the pre-service teachers in Other sites (15 of the 19 participants, or 79%) made comments aligning the use of mobile devices with aspects of cultural philosophies. Table 6-24 shows data about RATEP students from Other sites.

Table 6-24 Comments linking use of mobile devices with aspects of cultural philosophies by ITE students from Other sites, by number of respondents

Cohort	**Sample**	**Comments linking use of mobile devices with aspects of cultural philosophies**				
		Cosmology	Ontology	Epistemology	Axiology	Any
Other	19	4	4	8	12	15

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between ITE students from Other sites and ITE students from very remote communities regarding linking use of mobile devices with aspects of cultural philosophies. This suggests that these perspectives are similar regardless of remoteness.

6.4.1.1.3 Anangu Education Workers

The key finding from the fourth research question is that mobile learning expresses elements of cultural philosophies. This is evidenced by 14 of 19 AEWs (74%) making comments about the use of mobile learning that align either positively or negatively, with at least one aspect of cosmology, ontology, epistemology or axiology. Table 6-25 presents data about the number of AEWs who made comments linking cultural philosophies and the use of mobile devices. The respondents varied for each of the four areas, so a fifth column is included to show the total number of AEWs who offered at least one remark.

Table 6-25 Comments linking cultural philosophies and the use of mobile devices by number of respondents

Sample	**Comments aligning cultural philosophies and the use of mobile devices by number of respondents**				
	Cosmology	Ontology	Epistemology	Axiology	Any
19	0	4	7	11	14

Almost three-quarters of AEWs made remarks indicating alignment between mobile learning and cultural philosophies.

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and all ITE students for comments about each of the four areas of cultural philosophy or for any of the four. The lack of difference between AEWs and all ITE students suggests that enrolment in an ITE course has no effect on perception of links between use of mobile devices and cultural philosophies. Rather, such perceptions are based on general usage of mobile devices.

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and very remote ITE students for comments about each of the four areas of cultural philosophy or for any of the four. The commonality between AEWs and very remote ITE students indicates tertiary study has no effect on perception of congruency between cultural philosophies and use of mobile devices. Instead, such views arise from everyday usage of mobile devices.

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between AEWs and AnTEP students for each of the five comparisons. The similarity between AEWs and very remote ITE students suggests that views about alignment of cultural philosophies and use of mobile devices are based on ordinary use of mobile devices, rather than tertiary study with mobile devices.

6.4.1.2 Analysis by characteristics of participants

6.4.1.2.1 Presence of mobile network service

The key finding from Research Question 4 is that the majority of participants from both sites with mobile network service (81%) and sites without mobile network service (86%) indicated alignment between mobile learning and at least one aspect of cultural philosophies. Table 6-26 provides information about such comments according to the presence of mobile network service.

Table 6-26 Comparison of comments linking use of mobile devices with aspects of cultural philosophies by mobile network service, by the number of participants

Mobile network service	**Sample**	**Areas of cultural philosophies**				
		Cosmology	Ontology	Epistemology	Axiology	Any
Absent	28	0	9	15	17	24
Present	36	6	8	16	17	29

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between groups on four comparisons, but significantly more participants at sites with mobile network service made comments about cosmology than participants without coverage. The overall lack of difference between the two groups is unexpected. One might think that people at sites with mobile network service

would be more familiar with using mobile devices and so be better placed to note any congruencies, than people with no coverage. However, the general lack of difference suggests people's perception of alignment between mobile learning and cultural philosophies is independent of the presence of mobile network service at the place where they live. It is likely that these views are based on what they have seen other people do and their own experiences of using mobile devices at locations with coverage.

6.4.1.2.2 Gender

The key finding from Research Question 4 is that a small majority of the male participants (56%) indicated alignment between mobile learning and aspects of cultural philosophies, whereas the overwhelming majority of females (87%) provided responses. Table 6-27 provides information about such alignment by gender.

Table 6-27 Comparison of general comments about cosmology, ontology, epistemology or axiology by gender, by the number of participants

Gender	**Sample**	**Areas of cultural philosophies**				
		Cosmology	Ontology	Epistemology	Axiology	Any
Male	9	2	0	2	4	5
Female	55	4	17	29	30	48

Chi-Squared Tests at 95% confidence level showed that there was no significant difference between genders for each of the four areas of cultural philosophy. However, significantly more females than males made a comment on at least one (any) area. This overall difference is surprising, as one might assume a similar degree of familiarity with cultural philosophies for both groups. The difference could be explained by the child rearing and nurturing roles of mothers and females as having a primary purpose to inculcate cultural philosophies. If so, this familiarity with the nexus of teaching and learning might better equip females to identify alignment between aspects of cultural philosophies and mobile learning.

6.4.1.2.3 Age

The key finding from Research Question 4 is that the majority of both younger participants (88%) and older participants (81%) identified alignment between uses of mobile devices with aspects of cultural philosophies. Table 6-28 provides information on comments about such alignment, by age.

Table 6-28 Comparison of comments linking use of mobile devices with aspects of cultural philosophies by age, showing the percentage of the sample.

Age	Sample	Areas of cultural philosophies				
		Cosmology	Ontology	Epistemology	Axiology	Any
<25	17	3	8	11	7	15
25	47	3	9	20	27	38

Chi-Squared Tests at 95% confidence level showed that across four of the five comparisons there was no difference between age cohorts. However, significantly more younger people made comments about ontology than did older participants. This can be explained by suggesting that the views of identity are of particular importance to young people, and they see use of mobile devices as contributing to this. However, the overall lack of difference between age groups suggests perception of alignment between mobile learning and cultural philosophies is independent of age.

6.4.2 Emergent themes in findings from Research Question 4

6.4.2.1 Emergent theme 1: Participants identified features of cosmology and aligned elements of use of mobile devices with it

Cosmology, when considered from a philosophical perspective, refers to views about the nature of the universe and physical and spiritual realities. It thus provides a religious framework or metaphysical outlook. A common term is “worldview”. It is an attempt to integrate all that is possible. Six of 64 participants (9%) identified uses of mobile devices that can be aligned to three concepts and six characteristics of cosmology (as shown in Table 6-29).

Table 6-29 Elements of cosmology, linked to use of mobile devices, showing number of participants who made comments.

Concepts	Characteristics	Linked to mobile device use
Cosmos	The universe is connected	1
	People have connections to specific places	2
Spirituality	Spirit entities exist	1
Land	Land and waters provide food	3
	Weather affects life	2
	Plants provide medicine and tools	1

6.4.2.2 Emergent theme 2: Participants identified features of ontology and aligned elements of use of mobile devices with it

Ontology refers to views about the nature of being, becoming and identity. It deals with existential questions such as Who am I? Where did I come from? Where am I

going? Why was I born? What is the meaning of life? How do I relate to others around me? Ontology considers personal and social aspects of existence. Seventeen of 64 participants (27%) identified uses of mobile devices that can be aligned to two concepts and seven characteristics of ontology (as shown in Table 6-30).

Table 6-30 Elements of ontology linked to use of mobile devices, showing number of participants who made comments.

Concepts	Characteristics	Linked to mobile device use
Personal	Mobile devices can be used to create a person's unique Aboriginal and Torres Strait Islander digital identity	3
Social	Corporate identity can be promoted through mobile devices	2
	Accessing old photos on the internet through mobile devices affirms group identity	1
	Taking and sharing current photos through mobile devices reinforces relationships	4
	Communication on mobile devices can be used disrespectfully, leading to shame and fights	8
	Mobile learning prevents shame because it allows time to investigate topics	1
	Aspiration and identity formation can be fostered by role models on social media	1

6.4.2.3 Emergent theme 3: Participants identified features of epistemology and aligned elements of use of mobile devices with it

Epistemology refers to views about the nature of knowledge. It deals with questions such as What is knowledge? May it be sought or is it transmitted? Is there a fixed body of knowledge, or can new knowledge be created? Can a person gain all knowledge? How do people learn? How do people teach others? Thirty-one of 64 participants (48%) identified uses of mobile devices that can be aligned to three concepts and 10 characteristics of epistemology (as shown in Table 6-31).

Table 6-31 Elements of epistemology linked to use of mobile devices, showing number of participants who made comments.

Concepts	Characteristics	Linked to mobile device use
Controlled	Knowledge is passed on from younger people	7
	Learning occurs with others	10
	Learning occurs spontaneously	10
	Sharing occurs spontaneously	8
Experienced	Learning occurs by watching	10
	Learning occurs by listening	5
	Learning occurs by doing	11
Organised	Learning occurs at specific places	1
	Learning is cumulative from infancy	1
	Storage of knowledge is important	1

One characteristic that emerged from the data aligned with general elements of epistemology, but did not match that feature: in general terms in Aboriginal and Torres Strait Islander societies, knowledge is controlled and passed on from older generations, whereas with regards to learning with mobile devices, seven people indicated that younger people teach older ones how to use mobile devices.

6.4.2.4 Emergent theme 4: Participants identified features of axiology and aligned elements of use of mobile devices with it

Axiology commonly refers to views about values and ethics and what is worthwhile. It can include what is seen as good, right and important as well as virtues, morals and norms. Thirty-four of 64 participants (53%) identified uses of mobile devices that can be aligned to two concepts and 10 characteristics of axiology (as shown in Table 6-32).

Table 6-32 Elements of axiology linked to use of mobile devices, showing number of participants who made comments.

Concepts	Characteristics	Linked to mobile device use
Identity	Looking at old photos boosts pride in identity	1
Relationships	Swearing, gossiping and teasing are wrong because they don't show respect	8
	Stealing mobile devices causes tension about possessions	13
	Sharing money is an important way to share resources	4
	Trusted friends can help with passwords	1
	Sharing current photos enhances relationships	4
	Arranging to meet others strengthens relationships	3
	Communicating with family is important	25
	Parents value mobile devices to help children's learning	1

6.4.3 Vignettes from participants

6.4.3.1 Cosmology

One student identified how use of mobile devices to access information about the environment complements Indigenous Knowledges and can assist in activities such as hunting:

> You could check up a time on a mobile phone or you know. Another would probably be the weather or change of patterns in the oceans you know for hunting … going on your iPad and checking up what the sea is going to be like today. (Participant 31, 367–369)

This person made strong links between learning things in specific locations and affirmed the role of mobile devices in place-based learning, which aligns with traditional approaches to learning:

> Where you're learning or where you're doing something has a big impact. For example, when I'm teaching my kids something we go to a certain place. We learn about using spears and nets and different things in different places. That's just a brief way of saying that being in certain places is better for learning certain things. So by being mobile, having a mobile device could enhance learning by being in the best place to do it. (Participant 6, 361–377)

6.4.3.2 Ontology

This person said that using Facebook on mobile devices can create shame. This may spoil people's sense of identity:

> I don't want it [aspects of study] in the Facebook – shame job. (Participant 63, 300–302)

This student described how social media on mobile devices can be used in negative ways to cause shame. Gossip destroys a person's sense of self:

> Facebook has destroyed … like mobile phone. You know you can use it wisely but when you're trying to train young ones, they just don't seem to … so much gossip! (Participant 33, 423–428)

In contrast to the quotes above, this student gave an example of using a mobile device to seek information through the internet to strengthen her sense of identity:

> Well, I don't really know much about my culture. And last year we had to do our identity assignment. And my dad, he's like me, he doesn't know much about his family. So we worked together and done some research and talked to everybody and found out a lot of stuff about our family that was interesting. … We went on Ancestry.com and looked some stuff up. So that's where it came in handy. (Participant 29, 266–269 + 298–299)

This person described how people are constantly taking photos, including selfies. I suggest this helps to strengthen relational identity:

> *Panya urani munu mantjira tjunanyi palu anyway palakutu anu munu putukarapa tjuṯa* [~ They take and save photos and go away with lots of photos]. *… Anyway walytja walytjangku kulupa anu* [~ They take 'selfies' with their family and individually]. (Participant 4, 108 –115)

One woman talked about how on Facebook it was possible to create an identity which disguised your true identity:

> Make another profile picture with another name. You could have your name except maybe …*Uwa* [~ Yes], a pretend one. Yes, with a middle name and other user name: "[community name] AEW", something like that. "[community name] AEW1", "AEW 2", or just "AEW" and then "PS". (Participant 62, 343–352)

Another person suggested that use of social media accessed through mobile devices can assist in presenting a professional identity, which encourages the person, and serves as a role model to others:

> You could always have a Facebook page and stuff on it there for the group, and also updating what's happening … So it gives someone more encouragement as well and gives them a boost as well. … So if you have a social media site like Facebook or something like that… other Aboriginal people or Torres Strait Islander people are doing AṉTEP and they saw this group of Aboriginal people or Torres Strait Islander people have done this and this is where they're **at** … like "I wish I could do that"… it encourages them a lot [emphasis in original]. (Participant 64, 282–296)

6.4.3.3 Epistemology

Another student indicated that use of mobile devices can prevent shame in formal learning contexts, as a person can take time to look up the resources and feel confident before proffering an answer:

> It is like that sometimes, you don't really know the answer, but when you go back and research you have a better understanding. (Participant 26, 281–282)

In this quote a student said that in contrast to traditional culture when elders taught younger people, nowadays, with mobile devices, the roles are reversed:

> But when it comes to technology, I suppose today our children are actually teaching us. (Participant 33, 367)

These students gave examples of unplanned learning, learning by trying, and sudden sharing with mobile devices, which are similar to traditional ways young children learned together:

> Yes, yes. Because yes, you don't have to prearrange a time and wait for that time. You can deal with it straight away, you can immediately have contact with somebody to have a question answered, to organise something. … to go and see somebody. … its convenience, its just there. (Participant 25, 329–332)

> Yes, when teacher asks a question, and I just went on Google on my phone and checked it and answer it. Or when we debate about something, when someone asks us something and you argue about it, so you just Google the answer. (Participant 30, 300–302)

These students suggested that experimentation, repetition and successive approximation by individuals, as well as having friends demonstrate, are learning strategies with mobile devices. These fit with elements of childhood learning in Aboriginal and Torres Strait Islander societies:

> [To learn on a mobile device] it would involve becoming confident probably through repetition of how to use something. Personally I would learn how to use something by myself just going and clicking around. (Participant 19, 207–209)

> I just went into different things that were on the iTunes just to see how it worked. I went through all the categories that they had there and just tried to keep it in mind on how it worked. And [name of friend] was there to show me how to use it as well! (Participant 21, 121–128)

An older woman said that mobile devices helped her fulfil her cultural responsibility to teach others:

> *Wirunya nyanganpa tjuṯa katinytjaku munu nintini tjuṯa* [~ These mobile devices are good because we can take them and show others]. (Participant 4, 398–400)

This man, in a leadership role, suggested that mobile devices were useful for storage and display of information. They fitted with his cultural duties to safeguard knowledge and reveal it to appropriate people:

> I think it's really good for, for all that stuff we can use – like [data] projector you know [and] our laptop – for all these works we've got like reports and keeping it in. (Participant 3, 596–601)

This person described an individual experimenting on a mobile device. This fits with

the freedom children have to develop their daily life skills:

> When you see that menu and you have to read and understand, … it shows you what to do when you log in, show you how to log in, maybe on the university thing ... log in and then it shows you the different things you wanna do. (Participant 47, 475–479)

These two AEWs discussed learning how to use social media and said it occurred in a group with younger people teaching the older generation. Group learning fits with traditional patterns, but younger folk teaching older ones is the opposite of historic cultural ways:

> AEW 1
>
> Ahh Facebook. *Tjinguru kutjupa tjuṯa like tjitji tjuṯa panya* [~ Maybe it was others, like the kids] [who taught us how to use Facebook].
>
> AEW 2
>
> Maybe their children might have learned them or ... 'cause you know we got all the younger generations using Facebook these days. (Participant 53 + Participant 55, 688–694)

6.4.3.4 Axiology

This person mentioned that mobile devices are useful ways of communicating quickly with family members when there are emergencies. This supports values of helping relatives:

> Mobile is like … when you're in Alice Springs, or somewhere like in the city or town, you can usually ring – like when you're like, your family passing away or like accident. And they ring really quick[ly]. Otherwise if they don't have credit, they can use like Facebook or texting. (Participant 5, 1226–1239

These students emphasised the benefit of mobile devices for maintaining relationships:

> [You use mobile devices to get in touch with] family members who have moved away, or [you] haven't seen for a long time, or plan a trip and get in contact with them that way. I guess like it's just communication-wise, because if anything happens, as soon as it happens, you can pick up the phone and dial, or just text, and let them know what happened. Instead of sending a message from here to there to there, you can send in a couple of seconds. (Participant 8, 571–581)
>
> You don't want to lose that, this connection from your family and your friends and stuff like that. And I think one of the ways that they use things here in [name of community] is Facebook to keep in contact with people. People here, they come and go and you know, whenever they feel like it, 'cause they got connections in other communities as well, oh like on [name of location] or up on [name of location]. So they're not always here in the community, so a good way to keep in touch with those kind of people is usually on Facebook. (Participant 9, 384–392)

Another person expressed frustration that social media on mobile devices caused fights and disrespect:

> There's like Facebook, and have you ever heard of "Divas Chat"? In communities, they're lethal, because people use it for the wrong reasons, and it caused so much fights. So I would wish that you know, Indigenous people would be taught how to use it, and not use it, just to do things to cause fights. … Like WHY does it happen for Indigenous communities and Indigenous people that this form of social media is just taken up to another level of …? And then it turns into big family fights on Facebook or family fights that are just posted. I just don't think they're a way of etiquette. It annoys me because I hate to see, when my friends are doing that on Facebook. (Participant 7, 2052–2118)

These quotes describe incidents of mobile devices being stolen and resultant arguments, financial loss and disruption to study. Theft goes against the traditional value of respect:

> When they get iPad some people in the community they steal it. And they delete the things that we put on or our work. They take it and put some photos up about them at the front. They put more games for them to play. … But if we not there, they always go into room and search around in the room to get iPads and mobile phones [our relatives do this] *Walytja* [~ family]. … When the iPad got lost or stolen, the person [who owned it] starts arguing with that person who got that iPad. … It's hard to have it at home – it's safer in the school, but it's not safe in the house. Sometimes we lost the key or we leave the door open. When we come for work, they go in the room and they steal the iPad. … I got a little iPad for [name], a little mini-iPad. One of the men from [name of community] they stole it – they jumped through the window into [his] bedroom and they got that iPad. And we got back … we saw that that door was open. (Participant 1, 430–625

> [We] are frightened for [sic about] stealing. I always carry mine [my laptop] around, but sometime you forgot for a second, you moved or something, busy or forgot it; come back and look, "Oh where's the laptop?" might be somebody walk out with it – that's why we scared. I sleep with my [mobile phone in a] bag. *Uwa ngayulu bag winki ngaringi* [~ Yes I always lie with my bag]. [Otherwise] they'll pick it up. (Participant 63, 116–157

> It won't work if it's [mobile devices are] in our homes, 'cause other people get the laptop *katinyi ngurangka* [~ they steal them in the house] steal; kids wanna play games on it. (Participant 51, 578–581)

This person spoke about encouraging people who were lonely or sad; so mobile device use supports traditional values of caring:

> [Mobile devices can be used] in a good way like friends, like saying "Hello." … I was talking to my sister, she is in Adelaide now. … She told me last night, no last night before, she had someone telling good things on her Facebook, and she was happy. … [You can use it for] making [others] strong, like helping that person. *Tjinguru* [~ Perhaps] [the person is] sad or alone. ... I always talk every night on the phone [with my sister], she was upset and problem in here [speaker points to her heart]. … If I write letter or something, [she might] still [be] waiting for next three days. *Uwa, ka nyangatja palya* [~ Yes, and this thing is good] – use it straight away. (Participant 41, 335–411)

Another person mentioned the use of mobile devices for parents to teach songs to children, which fits with traditional strategies:

> Mostly young mums, young parents usually use the iPad for educational learning games for their children's development, and also, songs as well. (Participant 64, 14–18)

6.4.4 Overview of findings from Research Question 4

The key finding from Research Question 4 is that the majority of participants (53 of 64, or 84%) made comments about the use of mobile learning that align with at least one aspect of cultural philosophies. This was the case in both very remote communities and Other sites. There were few comments about cosmology and more about ontology – particularly around negative uses of social media to cause shame and spoil identity. There were far more comments about both epistemology and axiology. Learning approaches used with mobile devices fit with unplanned experimentation and shared informal learning seen in traditional and contemporary culture. Mobile device use supports the key cultural value of maintaining relationships through fostering communication. However, malicious use of social media on mobile devices contradicts the value of respect. This overall congruence between use of mobile devices and aspects of cultural philosophies is a significant finding and will be discussed more fully in section 7.2.3.

6.5 Conclusion

The purpose of this research was to discover the beliefs and behaviours of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities in Queensland and South Australia, regarding the use of mobile devices in tertiary study towards an ITE qualification. Data was also obtained from pre-service teachers in Other sites in Queensland and from potential pre-service teachers in very remote communities in South Australia. This chapter had four main parts in which the findings for each of the four research questions were presented. Evidence demonstrated that the majority of participants (40 of 64, or 63%) were already using or intend to use mobile devices for educational reasons, viz: content, administration, personal encouragement and academic support. Evidence showed that the majority of participants (43 of 64, or 67%) indicated the use of mobile devices empowered them to be self-directed in their learning regarding time and place of study, as an example of enhancement of andragogical methods in tertiary study. Evidence revealed that most of the participants (35 of 64, or 55%) believed the use of mobile devices enabled them to work faster and complete study more quickly. Participants also believed that not being able to use mobile devices hindered study. Evidence established that the majority of participants (53 of 64, or 84%) believed mobile learning aligned with at least one aspect of cultural philosophies, such as cosmology, ontology, epistemology and axiology.

The following chapter discusses these findings in relation to an emergent theory of how the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. This is supplemented by a discussion of congruencies between aspects of cultural philosophies and elements of mobile learning that explain the uptake of mobile devices by these pre-service teachers.

7 DISCUSSION

The purpose of the research is to explore how the use of mobile devices might enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in remote communities. This chapter discusses the findings presented in the previous chapter and has three main parts. The first constructs a theory of enhancing professional learning through the use of mobile technologies for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. The second extends the theory by proposing an explanation for the popular adoption of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers in very remote communities, with reference to alignment between aspects of cultural philosophies and elements of mobile learning. The third sets out a novel perspective on the orientation of a researcher as one who comes alongside. The orientation is based on common notions of relatedness and friendship in different cultures. This is followed by a conclusion to the chapter.

7.1 A theory of enhancing professional learning through mobile devices

7.1.1 Overview of model

Chapter 6 presented a detailed analysis of the data according to the four research questions. This chapter takes the analysis to a theoretical level. As indicated in Chapters 3 and 5, I used Grounded Theory techniques to explore the data, looking for processes, actions and meanings. These techniques involved coding, categorising, and conceptualising as described in 5.4.1.3.

In commencing doctoral study I asked an initial question “How might the use of mobile devices enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in remote communities?” As demonstrated in Chapter 6, evidence from the data indicated that participants believed use of mobile devices did enhance their professional learning. Figure 7-1 consists of three nested circles around a central rectangle. This presents four main elements constituting a framework for understanding how the use of mobile devices enhances professional learning: context, precursors, catalyst and enhancing professional learning. The pragmatic realities of concentrating on tertiary study are constrained by the context of daily life and several factors are identified which affect completing the course. Prior to the uptake of mobile devices for educational purposes a number of precursors must be taken into consideration. The use of mobile devices in tertiary study is predicated on the presence of a catalyst. The ways in which mobile devices

are used within the context of studying for a qualification explicate the manner in which they enhance professional learning.

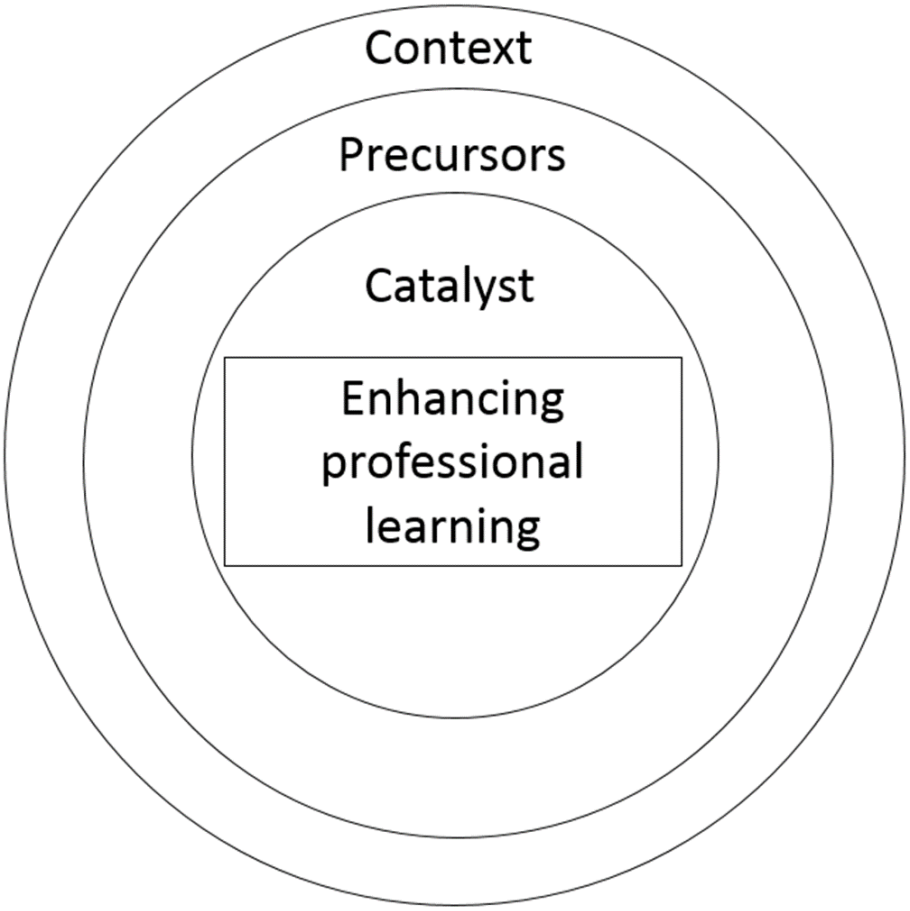

Figure 7-1 Framework for enhancing professional learning through mobile devices

I now describe each of the four components of the framework in more detail, to show how the data in the research led to the construction of the Grounded Theory. The outer ring of the framework is the context in which tertiary study occurs, as viewed from the students' perspectives (see Figure 7-2). Any tertiary student has a complex life, and study is only one aspect of it. Each student faces competing demands and allocates priorities. These priorities change over time, sometimes throughout the hours of a day. Participants in this research identified 11 factors that impact their study and others can be inferred from data in the literature: employment, health, home life, mourning, sport, religious activities, cultural activities, pregnancy, domestic violence, other people using drugs, and visitors. These are briefly highlighted.

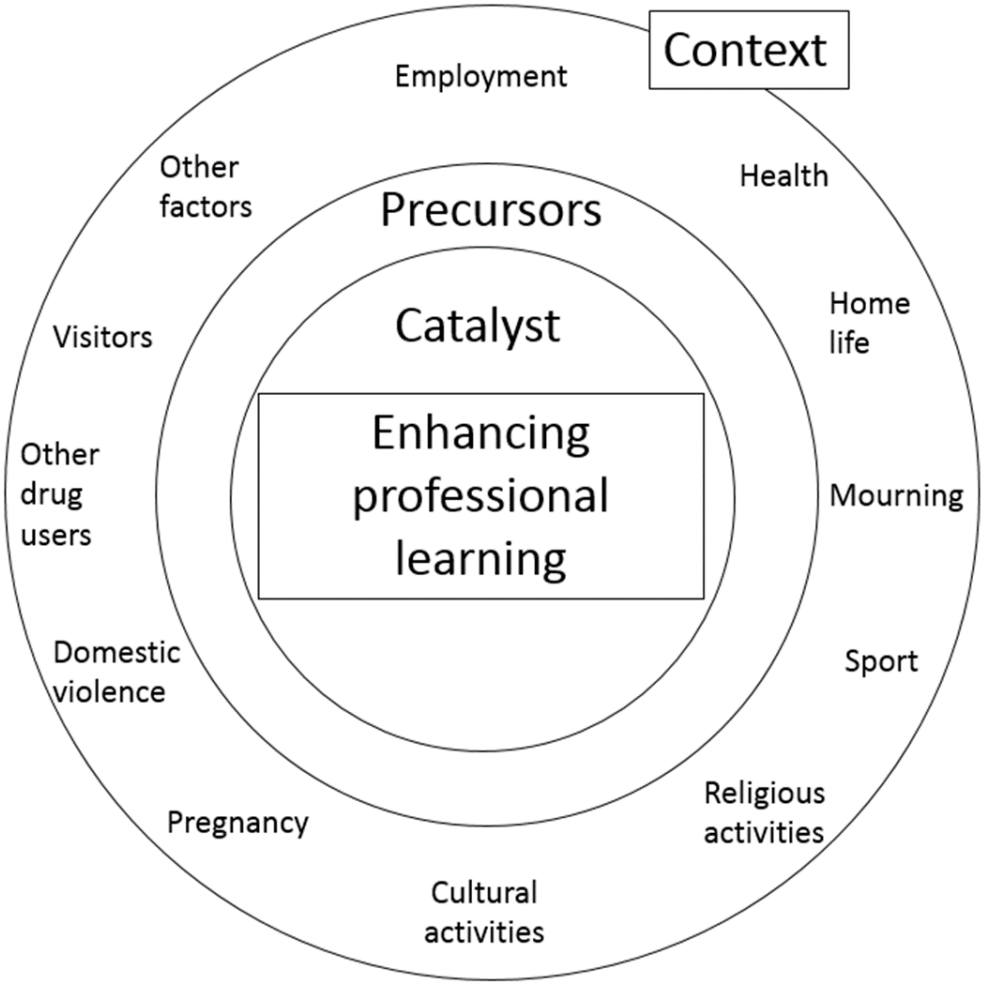

Figure 7-2 Life context of Aboriginal and Torres Strait Islander pre-service teachers

First is the matter of **employment** – nearly all of the participants were working either part time or full time in addition to being a student. In general terms, this means they have less hours per week to study than a person who is not employed. Furthermore, their hours of work may clash with the opening hours of the learning centre, and they might be unable to attend the learning centre during business hours. Hence, their access to both resources and the assistance of the support teacher is hindered. **Health** may also affect study. Across a number of health conditions, the statistics for Aboriginal and Torres Strait Islander people are worse than for non-Indigenous people (Australian Indigenous Health*InfoNet*, 2016b). This may mean that a pre-service teacher is prevented from studying due to his or her own health or because of providing care to someone else who is ill or injured. The overwhelming majority of students in these community-based ITE courses are women who carry significant responsibilities in their **home life**. Many are mothers who provide care for children, as well as managing the upkeep of their homes and preparing meals. Parenting and household tasks limit time available for study. Another factor is that

with mortality statistics nationally indicating the age-standardised death rate for Aboriginal and Torres Strait Islander people is almost twice that for non-Indigenous people (Australian Indigenous Health*InfoNet*, 2016b), ITE students are often in **mourning** for family and friends. The emotional load of grief makes study difficult, and attendance at funerals and related activities can mean physical travel away from home for several weeks, which interrupts study. **Sport** is a major social activity in Aboriginal and Torres Strait Islander communities. People frequently travel long distances and may be away from their home communities for several days or longer. ITE students may participate in or attend sporting activities in order to support relatives, which can disrupt study.

Religious activities are prominent in some Aboriginal and Torres Strait Islander communities. Generally, these are associated with Christianity. There may be regular activities on a weekly basis; in some places, these might happen each night. At particular times in the year special events may be held, and people will often travel long distances and be away for several weeks. Some ITE students may choose to give priority to these above study. **Cultural activities** of various forms, including religious ceremonies, undergird many Aboriginal and Torres Strait Islander communities. These can be daily, weekly or monthly. At times, large events, commonly called “business”, involving numerous communities are held. These can extend over many weeks. Pre-service teachers may have responsibilities to participate in these activities, and so study is put aside. For women students, **pregnancy** and care of infants may interrupt study, as they generally are physically tired, have extra responsibilities and have less mental energy for study. Women may also be victims of **domestic violence**. According to one report “Aboriginal and Torres Strait Islander women are 35 times more likely to be hospitalised due to family violence related assaults … [and] five times more likely to be victims of homicide than other Australian women … [and] five times as likely to experience physical violence …[and] three times as likely to experience sexual violence than other Australian women in the previous year” (OurWATCh, 2014, p. 5). Domestic violence can cause physical injury along with psychological trauma. In some cases, a woman might relocate to prevent further occurrences. These factors related to domestic violence also hinder progress in tertiary study. **Other people who are drug users** may impinge on a pre-service teacher’s ability to study, particularly if they live in the same house or are close relatives. Sometimes a person’s behaviour when they are seeking money to obtain drugs or are under the influence of drugs (e.g. marijuana and alcohol) may be disruptive to anyone seeking to concentrate on study. When **visitors** arrive, cultural obligations require people to offer hospitality.

This means houses can be crowded and usual routines disordered, so ITE students rarely have a quiet place for study at home (until after others have gone to sleep). There are probably also **other factors** not mentioned by participants. For example, there is a very high rate of incarceration of Aboriginal and Torres Strait Islander people (Australian Bureau of Statistics, 2016), so issues of attending court and visiting relatives in prison could be priorities that impact on Aboriginal and Torres Strait Islander pre-service teachers' available time for study.

It is acknowledged that the life of any person and any tertiary student is complex, and all people continually make choices. However, the factors listed here are grounded in the interview data, and have particular strength among the Aboriginal and Torres Strait Islander population in comparison to the mainstream society. On a daily basis, Aboriginal and Torres Strait Islander pre-service teachers make decisions between these demands and study. In Figure 7-5 a box extends from this element to enclose the rest of the diagram, indicating that it is within this context that the use of mobile devices can be seen as enhancing their professional learning as they study towards an ITE qualification.

The next aspect of the framework consists of precursors to the educational use of mobile devices (see Figure 7-3). Precursors precede the adoption of mobile devices and can affect the extent of usage either positively or negatively. The research data from interviews with participants contained six factors that I have labelled precursors: cost of device, supplier location, mobile network services, operating costs, internet filters and higher education providers' use of online learning.

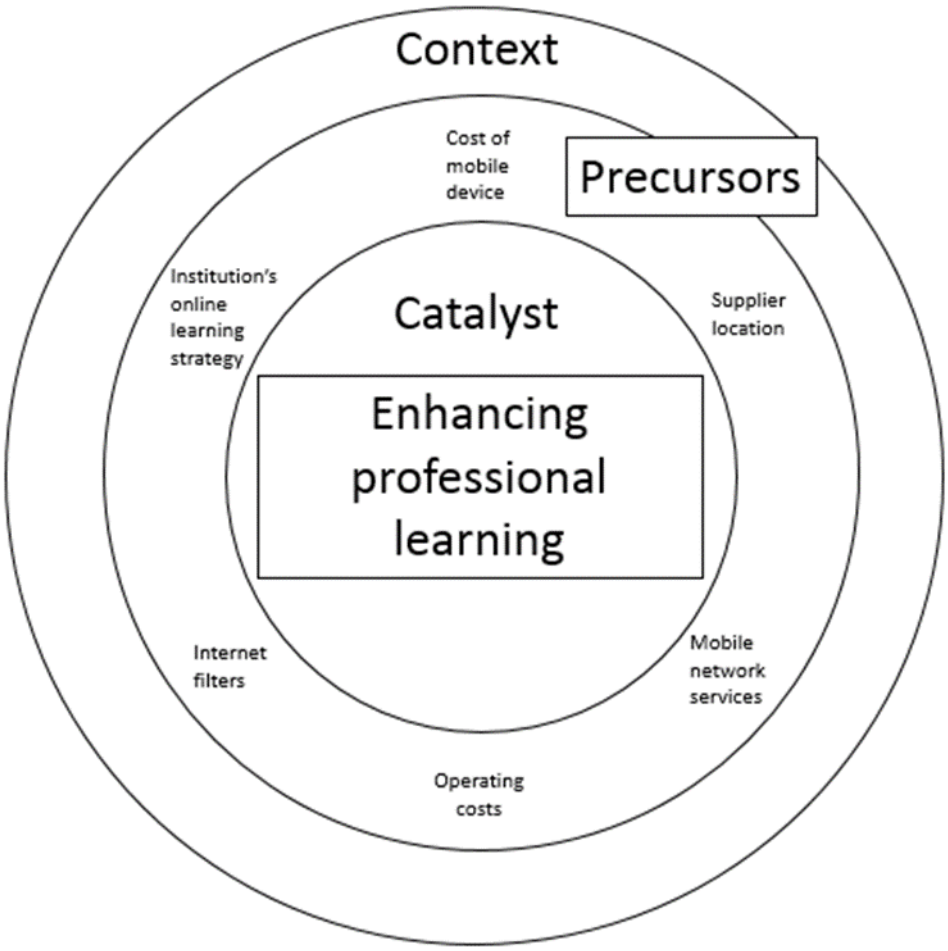

Figure 7-3 Precursors to educational use of mobile devices

These precursors match some of the barriers to use of the internet identified by the United Nations: “People in rural areas are often confronted with obstacles to internet access, such as lack of technological availability, slower internet connection, and/or higher costs” (United Nations, 2011, p. 17). The precursors mentioned by participants raise a number of critical questions related to the overall aim of my research to discover how the use of mobile devices might enhance professional learning for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. I discuss each precursor in turn.

First is the issue of **cost**. Whose responsibility is it to purchase the devices? Should the student pay out of his or her personal income, or should other entities be involved? This matter of the cost of the device will be discussed in section 8.2.9 – Recommendations for providers of community-based ITE programs.

A second pragmatic concern is the **location of the supplier** relative to the tertiary student. How easy is it for a student to buy a mobile device? Is there a retail outlet

nearby or a way of purchasing a mobile device and having it sent to the student? Mobile devices have great functionality, and can be used for a variety of purposes, such as storing and replaying or viewing a multiplicity of objects; capturing and editing photographic, video and audio material; as well as creating a range of products with word-processing, spreadsheet and database software. Many of these items can be shared between devices wirelessly.

Another factor relating to the use of mobile devices is the **presence of mobile network services**. Simply put, if these services exist, then the range of activities that can be conducted with mobile devices increases (e.g. talk, text and internet access become possible).

However, the **operating cost of the devices**, particularly the cost of mobile network services, may limit the extent to which mobile devices are used. As with the purchasing of devices, the same questions arise: Whose responsibility is it to pay for mobile network services? Should the student pay out of his or her personal income, or should other entities be involved? This matter of the operating costs will also be discussed in the following chapter under section 8.2.10 – Recommendations for providers of community-based ITE programs.

Furthermore, if **internet filters** are in place that restrict the websites a user can visit, over which a person has no control, then these filters also may restrict the scope of use of mobile devices. An important consideration is whether or not the higher education provider uses **online learning for its courses**. These six factors emerged from the interview data, and may be described as precursors to the use of mobile devices for educational reasons in tertiary study.

Next, the catalyst for the educational use of mobile devices is briefly described (see Figure 7-4).

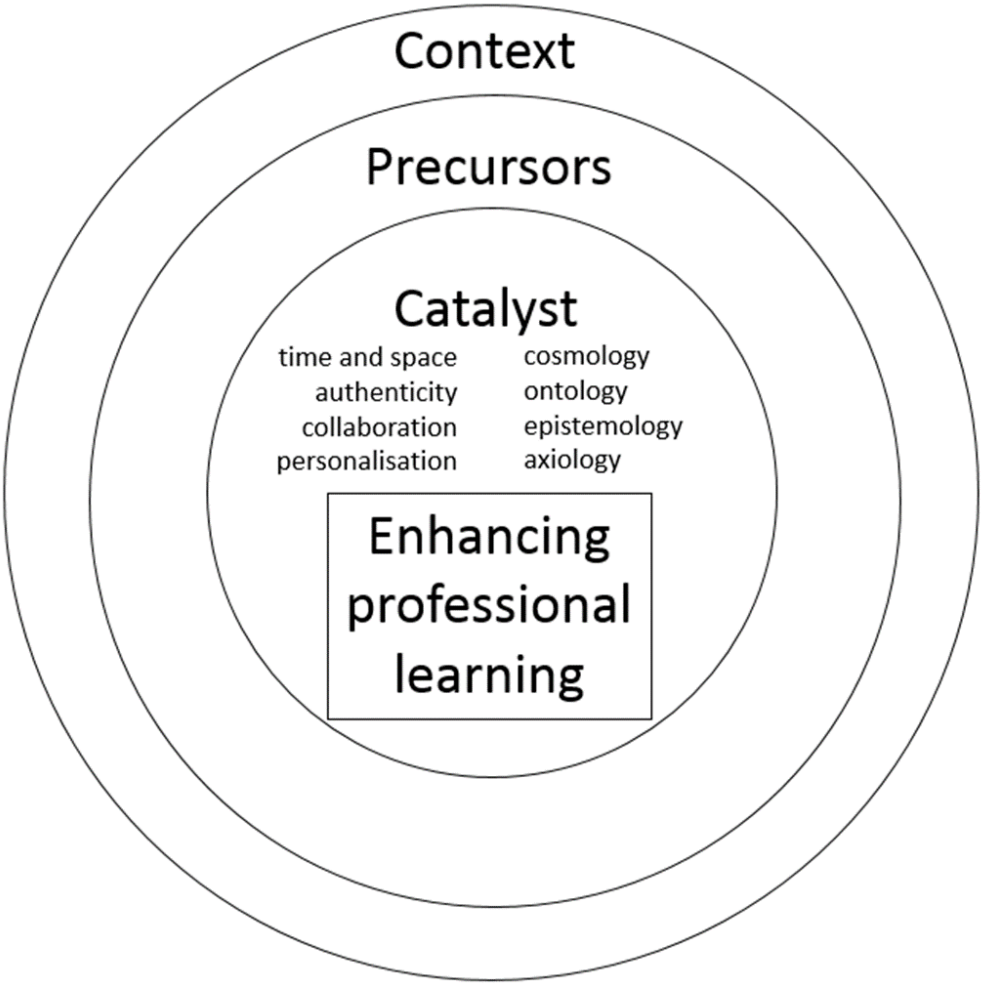

Figure 7-4 Catalyst for educational use of mobile devices for Aboriginal and Torres Strait Islander pre-service teachers

I suggest that the voluntary adoption of mobile devices for educational purposes by Aboriginal and Torres Strait Islander pre-service teachers is prompted by a catalyst. As use of mobile devices was not compulsory in the two community-based ITE programs in which research participants were enrolled, something must have motivated them to spontaneously use mobile devices in their tertiary study. Based on analysis of the research data, I propose that the catalyst is the perceived alignment of elements of mobile learning and aspects of cultural philosophies. Figure 7-4 portrays three main elements of mobile learning: authenticity, collaboration and personalisation, along with the use of time and space in mobile learning, as well as four aspects of cultural philosophies: cosmology, ontology, epistemology and axiology. Features of mobile learning are based on work by Kearney et al.(2012), and ideas about cultural philosophies are drawn from writing by Arbon (2008). The congruencies between these are discussed in detail in section 7.2. In short, Aboriginal and Torres Strait Islander pre-service teachers use mobile

devices because they fit with their culture.

Having described three elements in the framework for a theory of enhancing professional learning through the use of mobile devices, the full model is now set out in Figure 7-5. This is oriented horizontally to indicate the passage of time through a tertiary degree.

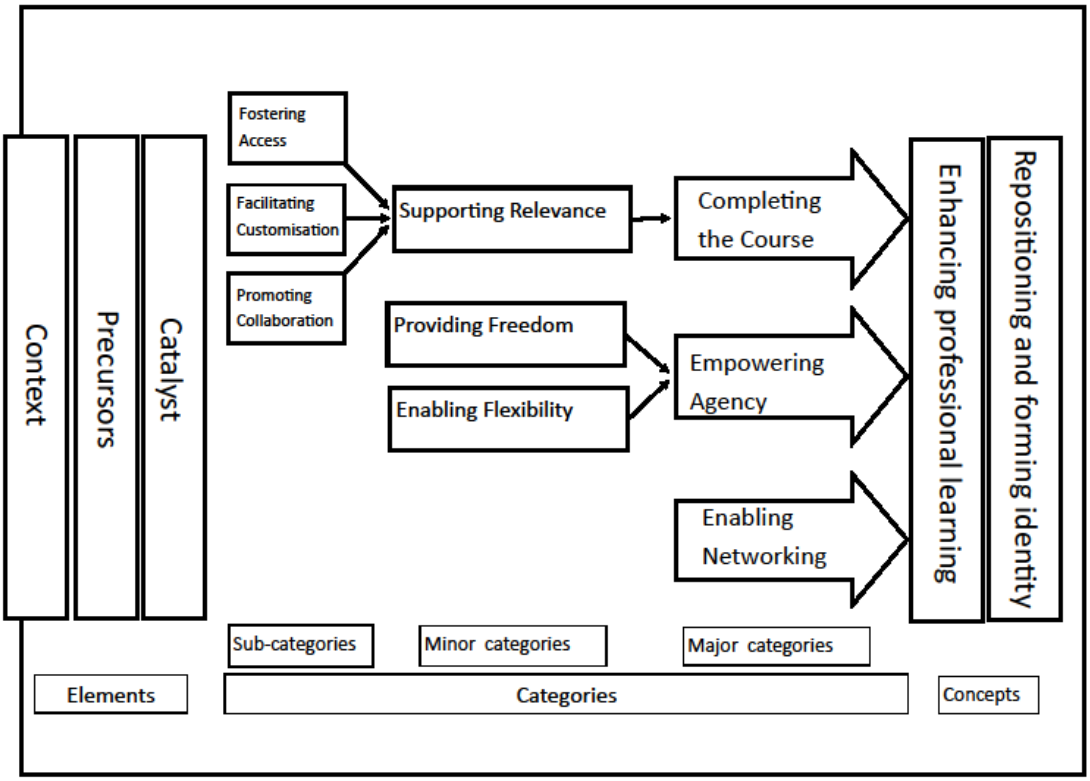

Figure 7-5 Enhancing professional learning through the use of mobile devices

At the left of the diagram are the three elements of the framework which were represented in Figure 7-1 as three nested circles (i.e. context, precursors and catalyst). Using a constructivist Grounded Theory approach, I identified codes and then organised some into sub-categories, minor categories and major categories and arranged these to show their contribution to the concept of enhancing professional learning and a larger concept of repositioning and forming identity.

First, three sub-categories are considered, with a brief overview being provided here before they are examined in more detail below. Of central importance to a student is being able to obtain the content material of the course, and mobile devices provide ways of connecting to this material. Codes relating to connection with content material were merged to create the category Fostering Access. Students also need to handle a range of administrative tasks. Mobile devices improve the efficiency of

dealing with administration, because the devices can be customised to suit the preferences of the user. Codes relating to managing administration were combined to create the category Facilitating Customisation. In addition, most students will need academic support throughout their course in order for their understanding to be deepened. This support can come from other students as well as from staff. Mobile devices enable staff and students to work together, so codes relating to academic support were pooled to create the category Promoting Collaboration. Together, these three sub-categories of Fostering Access, Facilitating Customisation and Promoting Collaboration underpin the minor category of Supporting Relevance. The minor category itself was created from codes about using mobile devices for working on assignments. Students progress through their course by completing compulsory assessment tasks. When the three sub-categories and the minor category are considered together, they constitute a main category called Completing the Course. The main category itself was created from codes about how using mobile devices fostered motivation to study and helped students achieve their goal of completing a qualification.

The second main category is called Empowering Agency. Community-based ITE programs generally operate within learning centres. However, many reasons prevent students from attending the study facilities during operating hours. Mobile devices facilitate study in various locations. Codes describing alternative places were placed together to create the minor category of Providing Freedom. Similarly, mobile devices permit study at other times. Codes relating to alternative times were collected to create the minor category of Enabling Flexibility. When these two minor categories are considered together, they constitute a main category called Empowering Agency. The main category itself was created from codes about how using mobile devices made study easier, was more convenient and gave students a sense of control in dealing with multiple demands.

The third main category is called Enabling Networking. A host of factors can affect study, some positively and some negatively. If the latter become overwhelming, then a student might withdraw from study. However, a person who receives personal encouragement is more likely to persevere and continue as a student. Mobile devices provide many ways for people to keep in touch and provide praise and emotional backing to one another. Codes relating to personal encouragement were clustered to create the main category Enabling Networking.

The three main categories of Completing the Course, Empowering Agency and Enabling Networking form the core concept of Enhancing Professional Learning

through the use of mobile devices. Students commence an ITE course with a purpose: their aim is to gain a qualification in order to commence a career as a school teacher. From the beginning of their study, they intentionally embarked on a process of identity transformation to become a professional in the workforce. Codes pertaining to life ambitions were grouped and combined with the concept Enhancing Professional Learning to form the larger concept Repositioning and Forming Identity.

7.1.2 Categories underlying the theory of enhancing professional learning through mobile devices

The nine categories presented in Figure 7-5 are now discussed; a definition is stated, followed by reference to both the findings in Chapter 6 and the literature. As AnTEP did not use online learning, the South Australian participants were limited in their use of mobile devices for educational purposes for enhancing their professional learning. Accordingly, when anonymous quotes are provided here as evidence that the categories are grounded in the data, they are drawn from Queensland participants associated with RATEP.

7.1.2.1 Fostering access

Access here is defined as the ability to connect with learning resources for the ITE course through mobile devices and so increase opportunities to obtain content material. Under Research Question 1, for the first emergent theme, 27 of 30 RATEP participants (90%) mentioned at least one use or potential use of mobile devices for connecting with content (see 6.1.2.1). Among all 64 participants seven kinds of content material were classified: subjects, resources, readings, everything, institution's website, other websites, and web-conferencing (see Table 6-9). Across all participants, five ways of using mobile devices were identified that increase connection with content material and learning resources: through CDs and DVDs; through downloaded apps and software; through the higher education provider's website; through the higher education provider's web-conferencing sessions; and through other websites.

This student spoke about the institution's website: "I think everything is delivered pretty well. On the JCU site, they've got all of our subjects, all the content there. You can just click on the site and go straight to it" (Participant 29, 142–143). Earlier in the interview, she had talked about participating in web-conferencing: "I use my laptop for Collaborate sessions – that's like classes. Usually I do them at home" (Participant 29 11-14). Another person mentioned online quizzes:

> I do have a laptop at home which I do use a lot after hours. … but I use that at home and log in through there, from home, through to university and do all my work from there. ... it depends on your workload. … So then I take a lot of work home, like assignments. I have online tutes and sessions that I need to catch up with and quizzes. And it's a lot of work. (Participant 31, 42-52)

This student commented on spontaneously browsing the internet: "When teacher asks a question, and I just went on Google on my phone and checked it and answer it. Or when we debate about something … and you argue about it, so you just Google the answer". (Participant 30, 300-302)

The evidence from this research aligns with recent literature about students connecting with content material through mobile devices. Sung, Chang and Liu (2016, p. 295) conducted a meta-analysis of the effects of integrating mobile devices with teaching and learning on students' learning performance, identifying four key points:

> The effect of such usage was greater for handhelds than for laptops; usage in inquiry-oriented learning was more effective than usage along with lectures, self-directed study, cooperative learning, and game-based learning; informal educational environments were more effective than their formal counterparts, and medium- and short-duration interventions were superior to long-term interventions. …

These features may be able enhance the effects of certain pedagogies, such as self-directed learning, inquiry learning, or formative assessment.

In a recent systematic review with health professions students Mi et al.(2016, pp. 73-74) noted that "all selected studies reported the advantage of instant access to a variety of resources via mobile devices, particularly when being away from workstations". Similarly, a recent study by Witt et al. (2016) of tablet use by medical students in Botswana reported that "participants found value in having consistent and constant access to medical information, with convenient availability 'on the go'. … this consistent access is reported as having enhanced information gathering". Both the research data and current literature support creation of the category Fostering Access.

7.1.2.2 Facilitating customisation

Customisation here is defined as the ability to modify the mobile device's interfaces to suit the preferences of the user and so improve the efficiency of handling administration. Under Research Question 1, for the third emergent theme, 24 of 30 RATEP participants (80%) mentioned at least one use or potential use of mobile devices for handling administration (see 6.1.2.3). There were three main administrative uses of mobile devices: students checking notices, students

contacting staff, and staff contacting students.
One student stated, “I use my mobile to access emails to see if I have passed a subject that I’ve sent in”. (Participant 26, 104-106)

Pre-service teachers can customise mobile devices so that emails from the higher education provider are rerouted; they can create alerts and add apps which enable them to communicate with staff of their institution at convenient times and places; and they can add phone, email and social media contacts. Examples are given by these two students:

> If they send an email to my gmail or my EQ I get a text message on my phone that relates exactly the same message. So if I'm not exactly at my email, I have got it diverted to my phone so I still get the message. (Participant 13, 332–342)

> When you’re talking to your teacher, down at TAFE, whoever you want to talk to, put them on your ... they will be on your email list, so if they’re online you can talk to them already; they are on Facebook, you can chat communications to them. (Participant 33, 59–63)

A different person described the way staff contact students through mobile devices:

> Yes. There was a lot of emails. They did keep … the lecturers did keep in constant contact with you, by emails. Like there would often be daily [emails] from them about all sorts of stuff. Whether it’s deadlines are approaching or you need help or this next Elluminate’s [web-conferencing session is] coming. So that’s good, because they were constantly in contact. (Participant 25, 157–160)

Other uses by students include sending in assignments:

> You can even upload and send assessments back to the TAFE without actually coming into the centre. Especially if an emergency happens like you said before, if my children get sick and I have to stay home, it’s so much more convenient to have a laptop, than to be worried about running in and out [to the learning centre]. (Participant 18, 98–102)

Through the convenience and customisation of mobile devices students do not have to wait for several days or longer until the next time they can attend the learning centre to manage administration. Rather, pre-service teachers can deal with matters as they arise. Through the use of mobile devices they become more efficient at handling administration.

The evidence from this research aligns with literature about customisation of mobile devices. Gilmore and Pine (1997) noted that across a range of products, companies adopt four types of mass customisation: collaborative, adaptive, cosmetic and transparent. Under adaptive customisation, a company offers “one standard, but customizable, product that is designed so that users can alter it themselves” (Gilmore & Pine, 1997). In the context of digital media, Sundar and Marathe (2010,

p. 301) distinguished between personalisation and customisation, and pointed out that “user-initiated customizable systems do not tailor content on their own, but instead feature a number of affordances that allow users to make changes to the form and content of the interfaces. They give high priority to user control and involvement.” Both the research data and literature support creation of the category Facilitating Customisation.

7.1.2.3 Promoting collaboration

Collaboration here is defined as the ability to work together with others through mobile devices and so deepen understanding through academic support. Under Research Question 1, for the fifth emergent theme, 20 of 30 RATEP participants (67%) mentioned at least one use or potential use of mobile devices for academic support (see 6.1.2.5). Two areas were distinguished: academic support between students and academic support provided by staff. There was a high frequency of interaction between peers using mobile devices, as in the following quote:

> Just help each other, because everybody is in the same boat and doesn’t know if they are going the right way. … We often daily kept in contact. Whether it was by phone, text message … to give each other a hand. (Participant 25, 181-186)

Seeking and offering academic support to people in other communities through mobile devices means that students’ understanding is deepened as they work together and help one another:

> I’m doing Research Methods at the moment, and they all, they all get on to Facebook when they, you know, when they’re collaborating with each other and exchanging ideas. ... and most of the time you’re doing that at home. … You’d have your mobile devices and you were sitting down and you know, you were Facebooking other students to get support in regards to assignments. (Participant 9, 246-253)

Another student commented about using mobile devices outside of the opening hours of the learning centre when requesting help from staff:

> For me personally, like for … our support, I don’t have to wait – I don’t have to wait till I’m at RATEP to read my emails. … sometimes I get really impatient – I email one of my lecturers “When are you marking this?” … I ring up a lot, at least with some lecturers, the ones I feel more comfortable with, who talk a lot. (Participant 7, 1210–1218)

Mobile devices empower pre-service teachers to solicit and extend academic support. They can work with others for study purposes to deepen understanding. Mobile device use fosters both sharing of data and creative output between two or more people.

The evidence from this research aligns with literature about using mobile devices for

collaboration. A broad definition suggests collaboration occurs when “knowledge is shared or transmitted among learners as they work towards common learning goals” (Brindley, Blaschke, & Walti, 2009, p. 3). Online forms of collaboration are receiving increased attention (Cilliers, 2016; Mbodila, Ndebele, & Muhandji, 2014; Tucker, 2015). Terms such as online professional communities of learning (Rehm, Mulder, Gijselaers, & Segers, 2016) and communities of practice (Stoszkowski & Collins, 2015) have been used, and increasingly these are facilitated through collaboration on mobile devices. Both the research data and literature support creation of the category Promoting Collaboration.

7.1.2.4 Supporting relevance

Relevance here is defined as the ability to work on assignments for the ITE course through mobile devices and so strengthen a student’s capacity to finish learning tasks. Under Research Question 2, for the sixth emergent theme, 29 of 30 RATEP participants (97%) mentioned using mobile devices to complete learning tasks (see 6.2.2.6). The top six tasks listed were searching the internet, working on assignments, submitting assignments, watching material, typing, and accessing the provider’s website. Students can use a variety of apps and software to work on assessment tasks, as indicated here: “I’ve used it mostly with Microsoft Office, Microsoft Word to type essays and stuff like that – do up PowerPoints” (Participant 27, 40–41). Another student emphasised how using a mobile device enabled her to finish assignments: “We can research on the phone and we can actually complete our tasks you know” (Participant 11, 427–432).

Desktop computers that are in a locked learning centre are irrelevant to students when they cannot use them. In contrast, mobile devices allow students to continue working on learning tasks when and where it suits them, as described below:

> If I didn't have the computer and I needed to go down to the park or something and interview people, I guess it would come in handy and you'd have your mobile or whatever device there, could record voices, video footage, cameras, could research, you know, if I needed to Google something I could Google something for the kids or whatever that needed to be. (Participant 13, 117–121)

The same student mentioned the ubiquity and utility of mobile devices generally: “You see people living out of their phones these days. You know, it’s everything. It’s their calendar, it’s their diary, it’s their everything!” (Participant 13, 60–61). It is these features that make mobile devices relevant to the life of a student. Students can type essays, compile spreadsheets, take photos, make audio and video recordings, do editing and prepare PowerPoints and other presentations as aspects of their assignments. This student described using audio-visual features of a tablet for an assignment:

> I’ve done a lot of taking photos and recording. And that’s one of the things I did with the iPads, was record the students’ voices when they’re telling, retelling the story, ’cause they were making their own Indigenous story up and I wanted to add their voices to it. (Participant 9, 678–684)

The evidence from this research aligns with literature about use of mobile devices in higher education to complete learning tasks. Murphy (2014, p. 340) found that 78% of students used a laptop to complete assignments and 65% of students used a smartphone to take photos or videos as part of their learning. Pandey (2015, p. 831) stated that “tablets are … the preference device for completing many of the academic tasks for students”. Farley et al. (2015, p. 726) pointed out that “the sound and video recorders, cameras, and the ability to access web 2.0 tools for editing and sharing found in most modern mobile devices make it very easy for students to create and share content”. Data from over 50,000 undergraduate students in 11 nations was analysed with the following comments: “substantially more students use these devices for coursework now than three years ago. Laptop usage is almost universal. Significantly more students are using tablets and smartphones for academic work” (Dahlstrom, Brooks, Grajek, & Reeves, 2015, p. 21). Both the research data and literature support creation of the category Supporting Relevance.

7.1.2.5 Completing the course

Completion here is defined as the ability to finish all the compulsory assessment tasks through mobile devices and so gain an ITE qualification. Under Research Question 2, for the seventh emergent theme (see 6.2.2.7), 16 of 30 RATEP

participants (53%) believed the use mobile devices enabled them to complete their course and fulfil assessment requirements. This person said she specifically bought a mobile device to help her with her study: “It’s taken me seven years [to finish the B.Ed]. … I did buy one of my laptops for study. … I just figured I needed one at home. I just felt like I needed one” (Participant 27, 24-46). One student pointed to the way in which use of mobile devices consolidates comprehension, enhances motivation and prevents failure through lack of completion:

> [Using mobile devices] helps you build your understanding of something, so then you want to do it. Where sometimes if you have an assignment and you didn’t understand and you didn’t know what it was about, you’d put it off and off and off. And your study just goes on and on and on. And then you never really complete anything. (Participant 14, 165–169)

Another student said she would have stopped studying if she had not got her own mobile devices: “I would have just given up [if I didn’t have my own mobile devices]. … To study it meant I just have to have my own stuff and I had to do things on my own” (Participant 24, 417–419).

The evidence from this research aligns with literature about mobile devices facilitating completion. Mishra (2009, pp. v-vi) stated that the use of mobile devices “reduced dropout and increased completion” and can “have a beneficial impact on motivation and make it more likely that students will complete and pass the course”. In research with Aboriginal and Torres Strait Islander students in a tertiary enabling program the use of Facebook on mobile devices enhanced completion rates (Hall & Maughan, 2015). The RATEP off-site program – in which most participants use mobile devices for most of their study – was praised for its low attrition rate (P. Johnson et al., 2016, p. 89). Both the research data and literature support creation of the category Completing the Course.

7.1.2.6 Providing freedom

Freedom here is defined as the ability to study through mobile devices in places other than the institution’s learning centre and so increase opportunities to study. Under Research Question 2, for the first emergent theme, 28 of 30 RATEP participants (93%) mentioned that through the use of mobile devices they are not restricted to studying only in the learning centre in their community. Instead, they now have freedom of location for study. As indicated earlier in 6.2.2.1, participants mentioned eight alternative places for study: home, anywhere, meeting, residential course, outside, at the institution, in school classrooms, and while on excursions. One person asserted the mobility of people and insisted on the portability of study: “You need mobile. You need stuff to be portable, everything. People don't sit in an office all day

from 9 to 5 these days. Everybody is everywhere, so you need to be able to take your work with you" (Participant 13, 989–995). Study is no longer static. Place is no longer a limiting factor.

Another person enthused about internet connectivity: "You can have access to the internet wherever you go! That's what I love about it!" (Participant 31, 302). In this quote, the student pointed to the convenience of mobile devices in situations where people are obliged to travel:

> It's more convenient to have the mobile devices because … you can do things if you had to go away or something... a funeral or some family business... you could actually take your stuff with you and do it wherever you are. You don't have to rely on actually coming into the centre all the time. (Participant 18, 139–143)

Mobile devices empower pre-service teachers to choose where they will study.

The evidence from this research aligns with literature about use of mobile devices in higher education in places other than lecture rooms. Murphy (2014, p. 338) found that most students used mobile devices at home (88% with laptops, 81% with smartphones, 81% with tablets). Other places included while travelling as a passenger in a vehicle, in a public place (such as a park) and while walking or cycling. Additional places mentioned were "on holiday or on work trips away from home, in transit between daily activities such as waiting in a doctor's office, at a child's school or sports event or at a friend's house."

Farley et al. (2015, p. 4) stated that smartphones and tablets

> enabled students to learn in environments outside of the traditional physical campus or home study locations. Students were able to leverage these technologies to learn in a truly mobile manner and use these technologies to take advantage of spare moments within their daily routines.

Adams Becker, Cummins, Davis and Yuhnke (2016, p. 9) said that use of BYOD "can extend learning opportunities to times and places outside of the lecture hall". Both the research data and literature support creation of the category Providing Freedom.

7.1.2.7 Enabling flexibility

Flexibility here is defined as the ability to study through mobile devices at times other than the opening hours of the institution's learning centre and so enable engagement with study. Under Research Question 2, for the second emergent theme, 27 of 30 RATEP participants (90%) mentioned that through the use of mobile devices they are not restricted to studying during the business hours of the learning

centre. Instead, they now have flexibility of time for study. As indicated earlier in 6.2.2.2, participants mentioned eight alternative times for study: at home (a proxy for "when the learning centre is closed" or "when something prevents me from attending the learning centre"), nights, after hours, weekends, during residential courses, spare time, early mornings and during school holidays. This student asserted the benefit of mobile devices: "I reckon it does help, a lot, because you can do it in your own time as well, instead of just rock up to [the learning centre on week days] and then over the weekends". (Participant 28, 134–135). Another student stated: "[I use my laptop for study] every night until about 3 o'clock in the morning! And any spare time that I've had. But quite often I was up to 1 or 2 o'clock in the morning doing my study" (Participant 25, 64–65). Study is no longer bound by clock times. Opening hours are no longer a limiting factor. Rather, there is now flexibility of time. People can study when it suits them, as shown in this quote:

> After hours when I am at home, if I got homework to do or if I need to do like assessments and that, I do that at home [on my laptop] ... or when days like I can't make it in … [if I am] sick or you might be busy through the day and you can't be here, so you can work from home. (Participant 32, 138–142)

Mobile devices empower pre-service teachers to choose when they will study.

The evidence from this research aligns with literature about use of mobile devices in higher education at times other than during lectures or university library opening hours. Students want to study when it suits them. Murphy (2014, p. 341) found that 88% of students either marked "agree" or "strongly agree" to the statement "I want to be able to learn anytime, anywhere". Students use mobile devices to engage with study at any time through their day or night. Farley et al. (2015, p. 9) noted that students "make use of the time when they are on the go, moving between venues, while exercising, during a commute, and so on". Similarly, Farley et al. (2015, p. 725) mentioned that students use mobile devices to "access notes when on the go or when grabbing portions of time opportunistically". The unrestricted nature of learning through mobile devices is referred to by Adams Becker et al. (2016, pp. 3-4) when they stated that "there is freedom in being able to communicate with peers and find information any time". Both the research data and literature support creation of the category Enabling Flexibilty.

7.1.2.8 Empowering agency

Agency here is defined as the ability to make decisions and take control of one's personal daily life and future and so fulfil family, community and cultural obligations as well as study demands. Under Research Question 2, for emergent themes 1 and

2, 28 of 30 RATEP participants (93%) mentioned at least one aspect in which the use of mobile devices was facilitating or could enable them to be self-directed in their learning regarding time or place of study. For emergent theme 3, 23 of 30 RATEP students (77%) mentioned 10 of 11 factors which interrupted study (see 6.2.2.3) for which use of mobile devices could ameliorate the extent of disruption. Students can multitask and fulfil both study demands and other responsibilities:

> I can get on my iPad anywhere and still … like at the park, and still just get into JCU sites, still do some reading, still listen in. So yes, it's pretty good in that way. It's flexible wherever you are you can listen to it and keep up to date with it all. When I take my son to football training, he'll be out on the field and I can be sitting there doing my study. … And that's when I catch up. (Participant 14, 90–98)

Students appreciate the convenience of mobile devices and say they are helpful and make their lives easier. This woman said that using a mobile device "make[s] my life a lot easier, just because of everything that I've got going on. Even if didn't have work, I've got two young kids at home. So being at home is a lot more convenient to me" (Participant 29, 374–376). One student relished the choices she could make because of having a mobile device:

> I reckon it is a help because it gives you a bit of flexibility. … If I sit out here on the iPad, it's easy for me. … I used to go to the beach to study for my exams, and sunbake. You know, it gives you that freedom. … I honestly just think that mobile devices are just easier, oh make everything easier. Like more access to things – in more comfortable settings, to what you're comfort to. … yeah ENJOY it really! It's personal [emphasis in original]. (Participant 7, 726, 1303–1311, 1659–1664)

Another person described how in using a mobile device, students enter private worlds, and have autonomy over what they do:

> It's the freedom of finding you're sitting there in your own space and nobody is around you or there can be people around you, but that's your private little world. And you just go to town and look for what you're looking for, or what were you doing or where you going. And you know it's yours. You're in control of whatever you're doing. (Participant 16, 436–439

The evidence from this research aligns with literature about agency. Common frameworks for viewing agency tend to emphasise either individualised or socialised perspectives. Biesta and Tedder (2007, p. 136) proposed an integrated view: "Agency, in other words, is not something that people *have*; it is something that people *do*" [emphasis in original]. They (2007, p. 137) suggested that this concept of agency is "an *ecological* understanding in that it focuses on the ways in which agency is achieved in transaction with a particular context-for-action, within a particular 'ecology'" [emphasis in original]. Priestley, Edwards, Priestley and Miller (2012, p. 211) also encompassed the larger context in their thinking about agency:

> We have taken the view in this article that teacher agency is largely about repertoires for manoeuvre, or the possibilities for different forms of action available to teachers at particular points in time. These are dependent upon temporal aspects – the iterative and projective, as well as the practical evaluative possibilities afforded by the material and social configurations of the present context.

In this research, predominantly with women Aboriginal and Torres Strait Islander pre-service teachers, elements of an ecological perspective and notions of room to manoeuvre are seen to be relevant, given the competing priorities upon their time and energy through family, community and cultural responsibilities. Both the research data and literature support creation of the category Empowering Agency.

7.1.2.9 Enabling networking

Networking here is defined as the ability to have casual social interaction through mobile devices and so be helped to persevere with study by personal encouragement. Under Research Question 1, for the fourth emergent theme, 18 of 30 RATEP participants (60%) mentioned at least one use or potential use of mobile devices for personal encouragement (see 6.1.2.4). Personal encouragement happened between student peers and by staff towards students. Students can share the personal details of their lives and so strengthen each other's wellbeing. Mobile device use facilitates building and maintaining friendships, as shown in this quote: "You really create friendships by a mobile device … through text message, through phone calls, through emails" (Participant 25, 373–376). One students said she used her mobile device to "stay in touch with each other and share life and stuff" (Participant 29, 178). Another student appreciated the interest shown in her by a staff member: "We get a lot of emails from [staff member's name]. The head honcho, he encourages a lot. The last couple of weeks as well [as we get near the end of the year when there is lots of pressure]" (Participant 21, 171-173). A range of factors might impinge on a person's desire to continue with study. The use of mobile devices among a cohort of students enhances morale to persevere, as expressed in the following quote: "We can say that it's our little community and we're contacting each other. Checking up on what we're up to, and we're going to continue" (Participant 28, 194–195). This is further articulated below:

> And for personal encouragement ... there really is nothing better than speaking to somebody or.... because I have tried, I've done them all... it really does rely on how I'm travelling at the time. So if I'm really ultra-prepared, this stuff doesn't bother me so much, but the moment I fall behind I get in that victim mode, and it's like "Help me, help me!" (Participant 24, 160–164)

Mobile devices empower pre-service teachers to request and provide personal encouragement.

The evidence from this research aligns with literature about using mobile devices for networking. Mobile devices enable people to link to social networking sites which Soomro, Kale and Yousuf Zai (2014, p. 278) described as “sites that establish and maintain connections with others”. Numerous such sites exist, with two well-known ones being Facebook and Twitter. Social connection with regard to using mobile devices was defined by Cui and Wang (2012, p. 637) as “the desire to engage with other people – for example, accessing a service to share some new content with others, such as photos, thoughts, and Web links – or directly approaching some contacts (both online and offline) to give or take information”. Both the research data and literature support creation of the category Enabling Networking.

7.1.3 Propositions forming the theory of enhancing professional learning through mobile devices

The categories just described, when considered together, constitute the concept of Enhancing Professional Learning. A theory of enhancing professional learning through mobile devices for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities is built on the following nine propositions.

The use of mobile devices by pre-service teachers enhances their professional learning by:

1. fostering access to learning resources – as pre-service teachers are connected with their mobile devices they are able to obtain content material

2. facilitating customisation – as pre-service teachers modify their mobile devices to suit their preferences, their efficiency in handling administration is improved

3. promoting collaboration – as pre-service teachers work together through mobile devices, their understanding is deepened through academic support

4. supporting relevance – as pre-service teachers use mobile devices to work on assignments and learning tasks, they progress through the stages of their course

5. completing the course – as pre-service teachers use mobile devices to finish assessment tasks, they fulfill requirements to be awarded a tertiary qualification

6. enabling networking – a pre-service teachers share their personal lives through mobile devices, their perseverance is strengthened through personal encouragement

7. providing freedom – as pre-service teachers choose alternative places to study with their mobile devices, they experience freedom from the learning centre

8. enabling flexibility – as pre-service teachers choose alternative times to study with their mobile devices, they experience flexibility from the opening hours of the learning centre

9. empowering agency – as pre-service teachers use mobile devices in prioritising the demands of study, daily life and their futures, they exert autonomy in decision-making.

7.1.4 Repositioning and forming identity

Under Research Question 2, for the seventh emergent theme (see 6.2.2.7), 16 of 30 RATEP participants (53%) believed that the use of mobile devices contributed towards the goal of having a career as a school teacher. For some, this has been a long-term ambition linked to social justice for Aboriginal and Torres Strait Islander people:

> It is a pathway I suppose, to success at this time. So it's always something that I've wanted to do. Ever since I left school, I wanted to be a teacher's aide or teacher. I always wanted to teach in the communities and indigenous people – beat that racism, just getting our indigenous people up there, on the right track. (Participant 12, 201–221)

Pre-service teachers using mobile devices are able to overcome various barriers and continue progressing towards a career in which they deliberately reposition their identity. One woman expressed her desire to form a new identity as a professional leader:

> Yes, definitely [using mobile devices helped me finish the diploma]. … I guess, my kids [are my motivation to do the B.Ed.]. I want to make sure that I'm a good role model for them. … I know that a Diploma is a good thing to have, but I want to get up there, I want to be a teacher, I want to be a Principal, I want to go further. (Participant 29, 234, 352–356)

Another person mentioned the help mobile devices are to achieving professional aspirations and advocated that training providers issue these to students:

> It would be, it would be so great if TAFE and JCU could make, offer students laptops for a, for the period of time that they're doing their studies. Just to get them to where they want to be. Just to achieve their goal at the end of their studies. (Participant 12, 655–661)

Mobile devices enable a person to achieve steps in fulfilling an ambition to complete their qualification, get a job as a teacher and have a career. Another student affirmed the way mobile devices assist in pursuing qualifications:

> People who are working (because I do know lots of the girls here, we're all working) [if they could not use mobile devices] that would really limit the opportunity to complete a Bachelor of Education. Just the extra stress of knowing that you had to get here [to the learning centre] within a set time frame to complete modules or assignments, or exams or whatever it is – so you've got the stress of having to complete that – but then you've got the extra stress on top of knowing you have to get here before 5 o'clock. … If you've got kids you've still got to get them dinner, you've still got to get that and you've still got to … it would just be additional stress that you probably didn't need. (Participant 25, 406–415)

Carlson (2013) has drawn attention to the place of social media in expressing Indigenous identity. More recently, Carlson (2016, p. 251) stated that "the potential of social media to foster, enable and enhance Indigenous connectedness and affirm identity was an exciting development". In that regard, an AEW suggested that use of mobile devices and social media creates and reinforces identity as a teacher-in-training which can place people in positions of being role models and inspiring others to also have career aspirations:

> You could always have a Facebook page and stuff on it there for the group, and also updating what's happening. Like … In April at [community name] this is what's happening with the AnTEP group at the school. This is what the AnTEP group in [community name] has done, this is what they're up to altogether. They're almost completing. And stuff happening. … updating others on it. Once everybody does this … from you start when you're a young age until you're old … you see something that somebody does … and you're going: "Oh I want to be in that position, I would like to be in that position right now". So it gives someone more encouragement as well and gives them a boost as well. So if you have a social media site like Facebook or something like that … other Aboriginal people or Torres Strait Islander people are doing AnTEP and they saw this group of Aboriginal people or Torres Strait Islander people have done this and this is where they're **at** … like "I wish I could do that" … it encourages them a lot [emphasis in original]. (Participant 64, 282–296)

The evidence from this research aligns with literature about identity. Identity is generally considered as how an individual sees himself or herself as a person and also how he or she sees himself or herself in relation to other individuals (Ricoeur, 1994). Another way of looking at identity is in relation to groups, particularly kinship and ethnicity. Some writers suggest that identity is fluid and can be adopted or released depending on circumstances. One focus of identity can be a job, career or profession. Mayotte (2003, p. 683) stated that "know-why, know-how, and know-whom competencies provide a framework for describing the motivations, skills, and networks that interplay in career changes [when a person seeks to become a school teacher] and that readily cross organizational and occupational boundaries". Later she suggested (2003, p. 693) that meeting in a professional community of learning "strengthens for participants a personal sense of identity and meaning in the teaching profession (knowing-why). These are stepping stones for success".

According to J. Williams (2010) people who have had one career and then change to become a teacher can be called “expert novices” during their training as teachers and early period in their new career. Most of the participants in this research were mature age students who had been involved in other areas before commencing ITE study. Hence these ideas about career change and identity are relevant. Identity here is defined as a social role influenced by other’s expectations and mediated by personal choice. This research has pointed to the use of mobile devices and social media in affirming Aboriginal and Torres Strait Islander identity as a professional teacher. Participants expressed identity with regard to their career, based on qualifying as a registered teacher through their professional ITE tertiary study. Both the research data and literature support creation of the concept Repositioning and Forming Identity.

7.1.5 Summary

I used an interpretivist, phronetic approach to constructing a Grounded Theory of enhancing professional learning through the use of mobile devices. The categories underlying the concept of enhancing professional learning emerged from analysis of interviews, which focused on four Research Questions. The problem of low rates of completion of ITE qualifications by Aboriginal and Torres Strait Islander pre-service teachers in community-based programs in South Australia and Queensland is addressed by the theory, which asserts that the use of mobile devices does indeed enhance professional learning. If that is the case, then metrics relating to access, retention, success and completion rates for tertiary study for Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs are expected to improve through the use of mobile devices.

The theory of enhancing professional learning through the use of mobile devices is set in a framework which addresses aspects of the use of mobile devices for educational purposes and includes context, precursors, and catalyst. The issue of the catalyst for the use of mobile devices is the subject of the next section of this chapter.

7.2 Why do participants use mobile devices for their study?

The findings in Chapter 6 indicated that mobile devices were popular with the research participants. That chapter described what people were doing with mobile devices. RATEP students in Queensland in both very remote communities and Other sites integrated the use of mobile devices in their tertiary study while enrolled in a community-based ITE program. In contrast, AnTEP students in South Australia in very

remote communities did not use mobile devices in their tertiary study while enrolled in a community-based ITE program. However, both they, and potential students who were Anangu Education Workers in South Australian schools in very remote communities, indicated a desire to use mobile devices for study while training to become school teachers. The previous section of this chapter detailed a theory on how the use of mobile devices enhances the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. The model of the theory indicated the context in which tertiary study occurs – as viewed from the students' perspectives, precursors to the use of mobile devices and also a catalyst for the educational use of mobile devices. This catalyst will be examined here to answer the question "Why do Aboriginal and Torres Strait Islander pre-service teachers use or want to use mobile devices in their tertiary study while enrolled in a community-based ITE program?"

Chapter 3, section 3.2 considered various theories of adoption of technology, and the issue of the impact of culture was raised. This was specifically noted in section 3.2.6, where reference was made to Tams' (2013) assertion of the social construction of culture and advocacy for the use of Grounded Theory in seeking to understand this issue. Jung and Gunawardena (2014, p. 187) endorsed a cultural approach to research in online learning, which they defined as "the systematic and systemic study of the ways in which cultural forces interact with online learning environments and online learner behaviors". In their article, they suggested four types of research: exploratory, cross-cultural, explanatory and design-based. Two examples of questions for explanatory research they gave were (Jung & Gunawardena, 2014, p. 189): (1) Which technology affordances affect online learning patterns? Why?, and (2) What cultural factors impact attitudes towards online interaction and learning?

This section takes up the call for explanation and provides an interpretation for the uptake of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers enrolled in community-based ITE programs while living in very remote communities. It presents this interpretation based on congruencies between the pedagogic/andragogic features of mobile learning and Aboriginal and Torres Strait Islander cultural philosophies. This interpretation is constructed with particular reference to the work of Matthew Kearney and associates, who devised a pedagogical framework and identified three features of mobile learning: authenticity, collaboration and personalisation (Kearney et al., 2012; Schuck et al., 2013). This view of mobile learning was selected for two reasons: it focuses on the learners' perspectives rather than the affordances of the mobile devices themselves, and it was developed within the context of teacher education in Australia. The interpretation about alignment

between features of mobile learning and Aboriginal and Torres Strait Islander cultural philosophies also highlights the perspectives of one Aboriginal academic, Veronica Arbon, the first Aboriginal Director of Batchelor Institute of Indigenous Tertiary Education. Arbon wrote about the place of cultural philosophies in tertiary education (Arbon, 2008). Her work is chosen also because it describes the worldview of the Arabana people who are desert people whose lands border the Pitjantjatjara and Yankunytjatjara, for whom AnTEP was established. As has been the case throughout the thesis, the work of Karen Martin (2008) will also be highlighted, as she has written about the place of cultural philosophies in the research process. I acknowledge that their views are not necessarily representative of all Aboriginal and Torres Strait Islander peoples. Nevertheless, they are Aboriginal and Torres Strait Islander voices which provide an authoritative and instructive basis for exploring congruencies.

This section has three parts: it looks first at Kearney et al.'s (2012) model of mobile learning, then Arbon's (2008) view of Aboriginal and Torres Strait Islander cultural philosophies and finally points to alignments between the two to suggest why Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs in very remote communities use mobile devices in their tertiary study.

7.2.1 Constructs of mobile learning

Kearney et al.(2012) presented a pedagogic framework of distinctive features of mobile learning represented by circular layers, as shown in Figure 7-6. At the centre is what the authors described as "malleable spatial-temporal contexts of learning", which can include "informal (physical and virtual) settings situated in the context about which the learning is occurring" (Kearney et al., 2012, p. 4). The two-way arrows depict a "symbiotic relationship" between mobile learning experiences and the use of space and time (Kearney et al., 2012, p. 8). The inner circle indicates the three main constructs of mobile learning: authenticity, collaboration and personalisation. Each of these has two sub-constructs, respectively: situatedness, contextualisation; conversation, data sharing; agency and customisation. In a more recent article, Kearney and Burden (2014) noted that each of these six sub-constructs is likely to be present at some level in any mobile learning context.

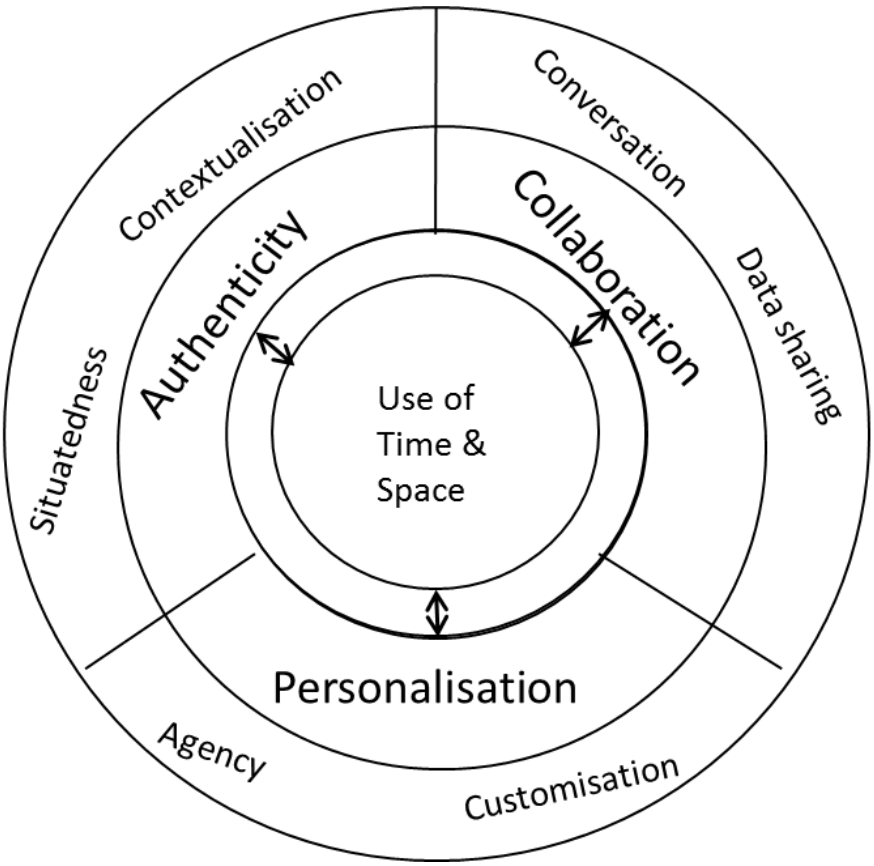

Figure 7-6 Features of mobile learning

Based on Kearney et al. (2012, p. 8)

Authenticity of learning with mobile devices occurs when the learner is participating in a community of practice (i.e. situatedness), and this situation is relevant to the learner (i.e. contextualisation). Collaboration happens when there is rich, deep dialogue (i.e. conversation) and includes the consumption, exchange and co-production of material (i.e. data sharing). Personalisation ensues when the learner has control of or can negotiate content and/or goals (i.e. agency) and modify activities and the mobile device itself (i.e. customisation). The next section outlines aspects of Aboriginal and Torres Strait Islander cultural philosophies as described by Arbon (2008).

7.2.2 Aboriginal and Torres Strait Islander cultural philosophies

Arbon (2008, p. 26) stated that "the metaphor of *Yalka,* a small onion that has layers which can be peeled to metaphorically reveal ontological foundations of what it is to be, know and do, is important here". She described ontology as an inner layer, followed by epistemology and then axiology as the outer layer (2008, p. 160). Based on these comments, Figure 7-7, represents a cut-away view of the layers of an onion. Cosmology was not mentioned as a distinct category with regard to *Yalka* by Arbon,

but is inserted in the diagram, as she described this, in a variety of terms, throughout her work. I discussed her perspectives with her in person and she did not object to including cosmology in the layers of *Yalka*. After discussion with her, I presented the following diagram in earlier presentations and this article (Townsend, 2015a).

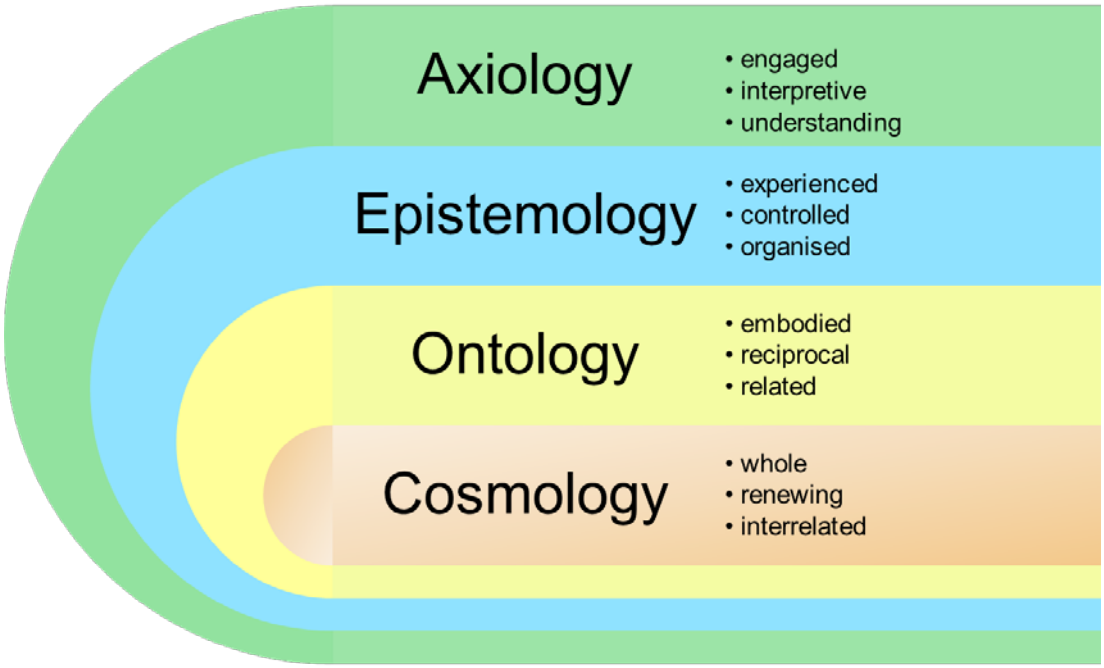

Figure 7-7 Arabana worldview perspective

Based on Arbon (2008)

The specific descriptors of each aspect of cultural philosophy will not be reiterated here as they were detailed in Chapter 3 (3.5). However, they will be integrated into the following discussion about alignment with elements of mobile learning.

7.2.3 Alignment between mobile learning and cultural philosophies

In this section, Kearney et al.'s (2012) mobile learning framework is interrogated or critiqued by perspectives of cultural philosophies. This is done in order to ascertain whether or not there are congruencies between the two, and whether or not such alignments serve to answer the question "Why do Aboriginal and Torres Strait Islander pre-service teachers in community-based ITE programs in very remote communities use mobile devices in their tertiary study?" If a model of mobile learning is to be applicable to Aboriginal and Torres Strait Islander people, it needs to align with the worldview they already hold. Hence, the mobile learning framework is inserted within the *Yalka* onion layers of cultural philosophies, as illustrated in Figure 7-8. This graphically represents the priority of cultural philosophies.

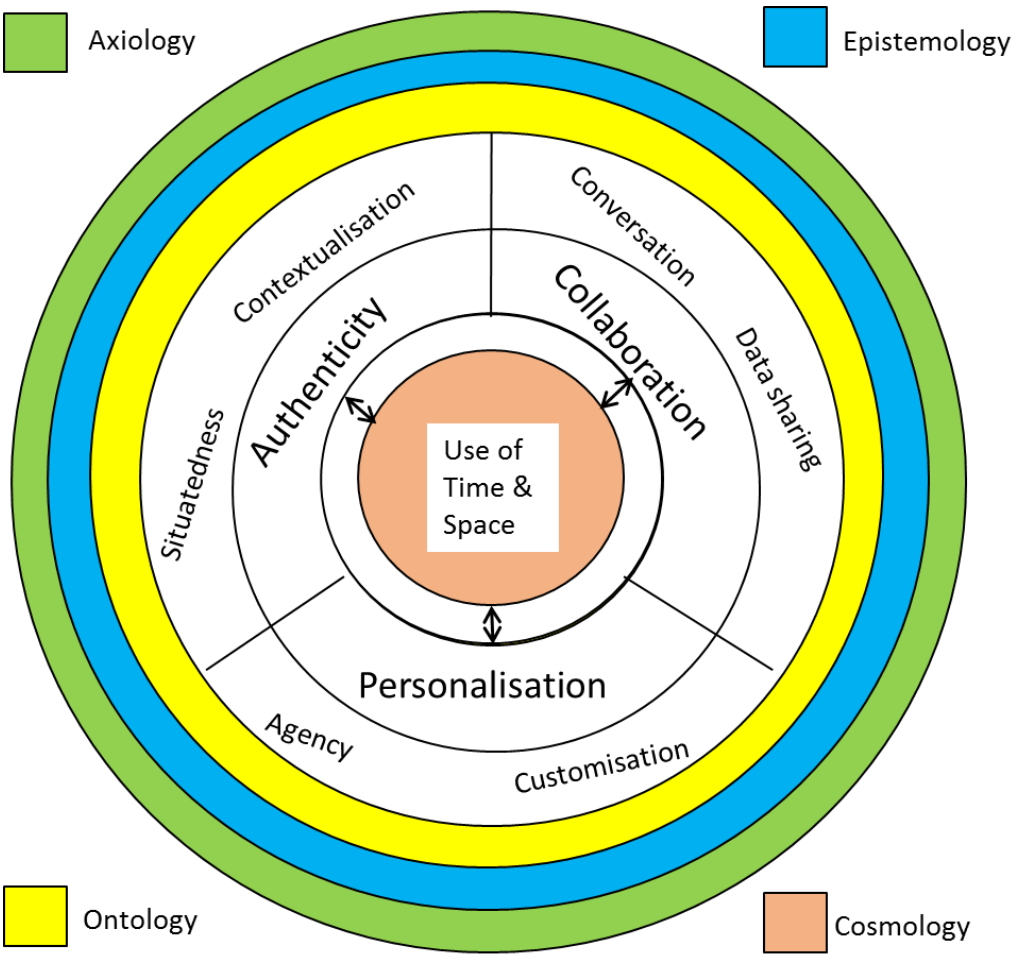

Figure 7-8 Aboriginal and Torres Strait Islander cultural philosophies critiquing a pedagogic framework of mobile learning

Based on Arbon (2008, p. 160) and Kearney et al. (2012, p. 8)

The following sections examine the three areas of authenticity, collaboration and personalisation in the light of Aboriginal and Torres Strait Islander cultural philosophies, with reference to the experience of being a pre-service teacher enrolled in a community-based ITE program. Segments from Figure 7-8 are used to focus on each of the three areas. First, the use of time and space will be considered in relation to cosmology.

7.2.3.1 Time and space and Aboriginal and Torres Strait Islander cosmology

For Aboriginal and Torres Strait Islander people, cosmology involves ancestors, stories/Dreaming, people, spirit beings, land/country, and the physical world. Arbon characterised cosmology as whole, renewing and interrelated. She pointed out that "for the *Arabana*, relatedness is where time and space is collapsed and organised" in effect, "bringing the ancient and today together" (2008, pp. 35–36). Martin noted "relationships within the relational humanist tradition are anchored across time and

space, and are experienced as more contexts are engaged. However, an Indigenist research paradigm is served by an ontology [worldview] that anchors all experiences to relatedness, no matter what the contexts" (Martin, 2008, p. 81). Martin thereby suggests that time and space are secondary and subservient to relatedness. A non-Indigenous writer with extensive experience among Aboriginal people in the Northern Territory of Australia talked about the merging of past and present:

> To travel through country with any Yanyuwa person is to become aware that past and present often merge at a point on a continuum. In Yanyuwa, human ancestors (*li-wankala*) are *li-ambirrijingu* (those who are in the lead, in front of us), and we living people are *li-ngulakaringu* (those who are behind); so there are times when those who are behind run into those who stand in front, and the past does not lie behind but is before us. In front, or leading us, stand a long line of ancestors, both human and non-human, to who we living people are accountable. (J. Bradley et al., 2010, p. 96)

Later, he described Aboriginal sacred song, using a vernacular term, *kujika*, and pointed to the fluidity of time and space:

> When sung in the proper manner, kujika becomes an invocation, calling forth the experience that it describes; it is never simply history or memory, nor a metaphor for something else. Kujika is of the now, of the ever being. When performed with full knowledge and enthusiasm, it becomes actual re-creation of the experience itself and a conjuration of the enchanted. (J. Bradley et al., 2010, p. 245)

This blending of history, memory and the present suggests mutability of time and space, and the possibility of being somewhere else at the same time. Vaarzon-Morel (2014, p. 8), a non-Indigenous researcher who has over thirty years of experience working with Western Desert Aboriginal societies in central Australia, referred to this within Aboriginal views of dreams: "Significantly, travel and communication in dreams are perceived to happen when a person's spirit (*pirlirrpa*) leaves their body to wander". She cited Fortunati's comments (2002, p. 518) on how the use of mobile phones, in a similar process to what happens in dreams, gives people "the capacity to split themselves into two, to be present and absent at the same time, as well as keeping their body in the background".

To express this capacity to be in two places and times at once I have borrowed a term used in Christian religious literature, that is, "proleptic embodiment". For example, in regard to the nature of the church, Dunn (2011, pp. 211-212) stated:

> Prior to Constantine, the church thought of itself as the proleptic embodiment of the kingdom of God. It was not the kingdom itself but a "foretaste" of the life to come. The church strove to be in the present what God would one day make it in the future.

The term can be understood to mean that a person in Place #1 can "be" with a

second person in Place #2. The second person has a “foretaste” of the presence of the first. Yet the physical body of the first person remains in Place #1, while he/she is proleptically embodied in Place #2.

This notion of proleptic embodiment underlies much of mobile learning. Kearney et al. suggested

> M-learning offers a variety of alternatives including ‘‘virtual’’ or non-geographical spaces, such as virtual world environments. … In temporal terms, the requirement to learn in fixed, scheduled time spaces … are [sic is] also relaxed enabling the individual to be more flexible about when they learn. (2012, p. 4)

The creation of virtual and non-geographic spaces which can be accessed through mobile devices resonates with the aspects of Aboriginal cosmology just mentioned. Aboriginal cosmology generally views time as non-linear. It may be described as quasi-cyclical and serves to fuse the past and the present, while a focus on events yet to come inaugurates the future into the present. Arbon (2008, p. 41) explained: “Knowing is about experience as generations cycle through generation levels and yesterday becomes today in experiences which locate and define responsibilities”. Kearney et al. (2012, p. 4) stated that “fixed notions of linear time are increasingly making way for a softer version of what some authors have termed ‘socially negotiated time’”. These “malleable” or “softer” views of time are congruent with perspectives of time within Aboriginal cosmology: “People value highly the social intimacy and proximity to relations afforded by mobile phones, particularly when away from home. Being able to contact kin at all times – even briefly – has the effect of compressing space, time and social distance” (Vaarzon-Morel, 2014, p. 11).

Most of the professional relationships outside a pre-service teacher’s community are virtual and long distance, often mediated through mobile devices. Fluid notions of space and time occur within the mobile learning environments of ITE for students in very remote communities. Mobile devices enable proleptic embodiment. Participating in web-based seminars; listening to podcasts; making video clips; using Skype; and talking, texting, sending emails and interacting through social media on mobile devices are all ways in which the alleged rigid boundaries of space and time are dissolved. Physical proximity in the same place is not required.

Aboriginal and Torres Strait Islander cosmology encompasses the mutability of time and space. This variability is experienced as places and times can be transcendent and/or immanent, that is, times and places can be beyond the ordinary limits of experience and/or “right here and right now”. Mobile learning occupies the liminal realms – at the transitions of space and time. It operates at the thresholds. The learner

is constantly “travelling” between the present, the future and the past; as well as between the here and the there. The creation of virtual and non-geographic spaces that can be accessed through mobile devices resonates with the multidimensionality of Aboriginal and Torres Strait Islander cosmology. These features of the pedagogic framework of mobile learning align with Aboriginal and Torres Strait Islander views of space and time and serve as a catalyst in the adoption of mobile devices by Aboriginal and Torres Strait Islander people. So too, this congruency explains the uptake of mobile devices for educational purposes by Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. The use of time and space will be mentioned again regarding personalisation. The next section looks at the construct of authenticity from Kearney et al. (2012)

7.2.3.2 Authenticity, situatedness, contextualisation and cultural philosophies

The comments of the pre-service teachers indicate that their use of mobile devices is embedded in their real community of practice as ITE tertiary students. These are not simulated or pretend contexts, but participatory environments. This is described by Kearney et al. (2012) as situatedness. Where learning through mobile devices occurs when it is not contrived or artificial but realistic and relevant to the learner, then Kearney et al. (2012) call this contextualisation. An example of situatedness and contextualisation occurs when pre-service teachers use mobile devices to prepare for teaching practicum experience – sharing their content material, ideas and feelings with fellow students and staff. This context is a participatory environment with genuine responsibilities as professional teachers in training with relevance to their progress towards qualification, and the application of Arbon’s (2008) theoretical framework described here will be related to that context.

Several possible alignments between Aboriginal and Torres Strait Islander philosophies and the sub-scales of situatedness and contextualisation under the construct of authenticity are presented in Figure 7-9. This is a segment extracted from Figure 7-8, with the addition of Arbon’s (2008) characteristics of cultural philosophies from the earlier Figure 7-7.

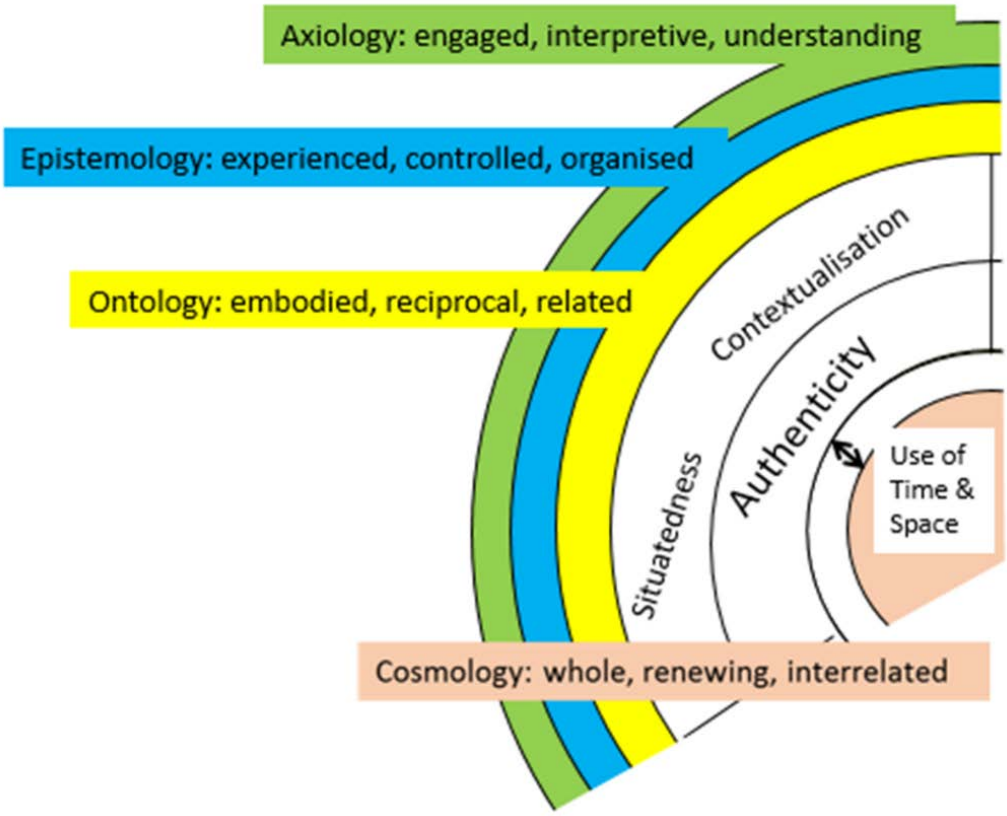

Figure 7-9 Cultural philosophies critiquing the construct of authenticity

Cultural ontology, as described by Arbon, emphasises that a sense of identity is formed through being related. Arbon asserts that "relatedness is central to being as *Arabana*" (Arbon, 2008, p. 34). In the context of preparing for the teaching practicum experience, pre-service teachers' sense of being is based on identifiable professional relationships formed by being part of a year cohort, assigned to specific school sites and to designated classes of children for particular subjects. A second ontological feature arises when Arbon (2008, p. 34) states that "for the *Arabana*, becoming who you are is accomplished by knowing your reciprocal relationships". The course requirement to work in partnerships (with either another student teacher or the teacher of the school) to prepare lessons for the teaching practicum experience can be seen as an example of reciprocity. Hence, a pre-service teacher's identity is only fully developed through reciprocity, and this may be facilitated through the use of mobile devices to collaborate and to work within respectful relationships.

At the level of epistemology, Arbon state that "knowing concerns experience in life and ceremonies" (Arbon, 2008, p. 41). The teaching practicum experience comprises elements of performance and ceremony enacted daily and is designed to foster

learning. As pre-service teachers use mobile devices in preparation for this, then epistemologically this behaviour can be aligned with the feature that knowledge must be experienced. Moreover, preparation for the teaching practicum experience through using mobile devices matches with epistemological characteristics of knowledge as organised and controlled. Arbon refers to two main classificatory groups in Arabana society as well as age and gender groups and emphasises that these "are critical to organisation for knowing"; she also state "both entities and knowledge are organised in order to move to one's potentiality" (Arbon, 2008, p. 43). The teaching practicum experience is based on the organisation of schools across age categories, subjects, and, in some cases, children's ability levels or gender. Thus, pre-service teachers' learning through mobile devices will itself be organised as they prepare for specific responsibilities. Arbon (2008, p. 48) explains another aspect of epistemology: "Knowing is controlled to ensure appropriate access to some areas of knowledge and knowing". Similarly, school pupils' knowledge acquisition is controlled through the various groupings across schools, with some elements of knowledge not allowed to be accessed by other groups. Again, as pre-service teachers use mobile devices to prepare for teaching practicum experience, their learning will be confined to certain areas and usage to particular groupings of people.

When considering axiology, Arbon (2008) talks about "right action" (p. 51) and that people have a responsibility to ensure "the appropriate outcome" (p. 52). She stresses that doing life requires active engagement: "engagement concerns all senses and more as one engages spiritually, mentally, physically and in a social context. In this way, all energies are engaged to understand. … Engagement is dialogic activity with all entities in our world" (Arbon, 2008, p. 49). This has parallels with the engrossed and highly dialogic way in which pre-service teachers use mobile devices to pursue their interests in preparing for an upcoming teaching practicum experience.

Cosmology has already been described above in some detail; in this context the use of mobile devices to enable phone calls, texts and messages between the pre-service teacher fellow students and staff at the school to which a person is going for teaching practicum experience are ways in which time and space are flexed. Using mobile devices to access the school's website and any photos, audio and video content on it allow the pre-service teacher to "be" there. Moreover, if a student uses a mobile device to video and stream himself or herself working with pupils, then this enables his or her lecturers to also "be present" in the classroom at the same time, though they may be hundreds of kilometres away. Alternatively, these videos could be watched after the event. In each of these examples, cosmological perspectives align with the situated and contextualised elements of authentic mobile learning, related to

a pre-service teacher's teaching practicum experience.

7.2.3.3 Collaboration, conversation, data sharing and cultural philosophies

This section turns to Kearney et al.'s (2012) construct of collaboration. Pre-service teachers mentioned two main ways in which they used mobile devices to collaborate. The first was to share personal encouragement and the second was to give and receive academic support. In Kearney et al.'s (2012) terms, personal encouragement is an example of conversation with rich peer interactions and academic support is an example of data sharing (both at a simplistic transmission level and also to the extent of co-construction of new material).

Several possible alignments with Aboriginal and Torres Strait Islander philosophies and the sub-scales of conversation and data sharing under the construct of collaboration are presented in Figure 7-10. This is a segment extracted from Figure 7-8, with the addition of Arbon's (2008) characteristics of cultural philosophies from the earlier Figure 7-7.

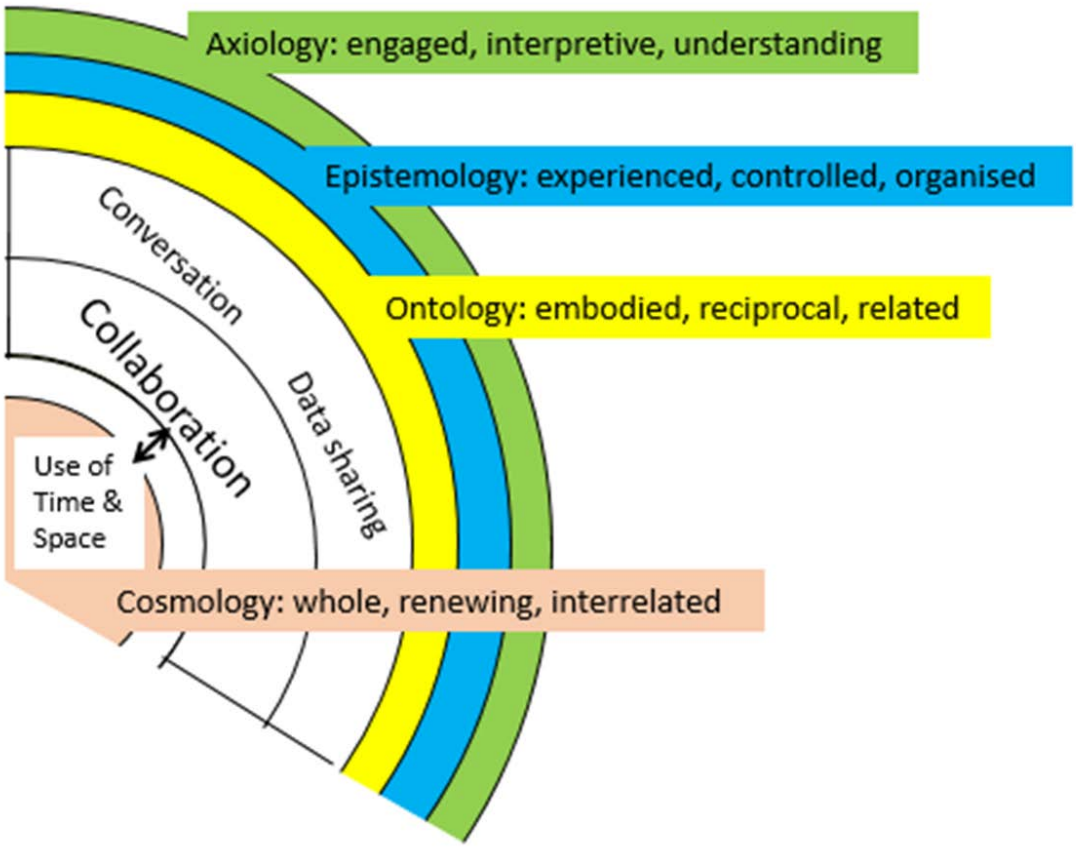

Figure 7-10 Cultural philosophies critiquing the construct of collaboration

Arbon (2008, p. 30) asserted that her people "see the world from a position of relatedness". Collaboration between humans fits with this cosmological emphasis on relationships. At the ontological level, Aboriginal and Torres Strait Islander people conceive of identity or sense of being as predicated on relatedness. It is impossible to exist as a single entity. A person can only develop an identity through reciprocal relationships. Thus conversations of personal encouragement expressing collaboration are the sine qua non of life. In discussing epistemology, Arbon (2008, p. 40) emphasised that "knowledge has a power or presence and this exists and is experienced, dialogued and interpreted in relatedness". As people share their experiences of the highs and lows of life, this dialogue means that personal encouragement deepens the experience of relatedness. With regard to axiology, "attaining higher moral and sacred goals and the well-being of humankind in general" are presented by Arbon (2008, p. 37) as important. This concern for wellbeing aligns with the underlying rationale of personal encouragement – it is aimed at enhancing one another's wellbeing. Cosmologically, the sharing of personal encouragement through the use of mobile devices means that a person can be "present" with another, in a different place to share their joy or sorrow; and this can happen asynchronously.

Participants identified numerous areas of conversation. A general purpose was expressed in the following terms: to share, share life, keep in touch, keep in contact and check up on what others were up to. Participants spoke about their online community, the network and friendships they had, and which they wanted to continue. They checked each other's physical location, offered and requested emotional support in times of illness and grief over the death of someone, as well as sharing jokes and sending congratulations on achievements. All of these facets of personal encouragement through mobile devices align with aspects of Aboriginal and Torres Strait Islander cultural philosophies as outlined above.

7.2.3.4 Personalisation, agency, customisation and cultural philosophies

Pre-service teachers intentionally customised aspects of the interfaces of their mobile devices in order to become more efficient in dealing with administration related to their tertiary study (see 6.1.2.3). Participants stated they could re-route emails from their institutional email address to a personal email address which was constantly open on their mobile device and for which they received immediate alerts. So too, they could receive alerts about postings on their institutions' learning management systems. Students added contact details in various applications to their mobile devices for fellow students, support teachers, lecturers and administrative personnel, and so could easily get in touch through telephone calls, text messaging, emails and social

media. These are examples of the assertion by Kearney et al. (2012, p. 9) that “m-learning experiences can be customised at both a tool and activity level”.

Participants used mobile devices to pursue study in various locations apart from the designated learning centres (see 6.2.2.1), such as at home, anywhere, in meetings, at residential courses, outside, at the institution, in school classrooms and while on excursions. So too, they used mobile devices to continue their study at times other than the business hours when the learning centres in their communities were open (see 6.2.2.2), including at home, at night, after hours, on weekends, during residential courses, in spare time, in the morning and during school holidays. These ways of using mobile devices empower students with agency by enabling flexibility and providing freedom. They align with the comments by Kearney et al. (2012, p. 9) that mobile learners “may have control over the place (physical or virtual), pace and time they learn, and can enjoy autonomy over their learning content”.

Several possible alignments with Aboriginal and Torres Strait Islander philosophies and the sub-scales of agency and customisation under the construct of personalisation are presented in Figure 7-11. This is a segment extracted from Figure 7-8, with the addition of Arbon’s (2008) characteristics of cultural philosophies from the earlier Figure 7-7.

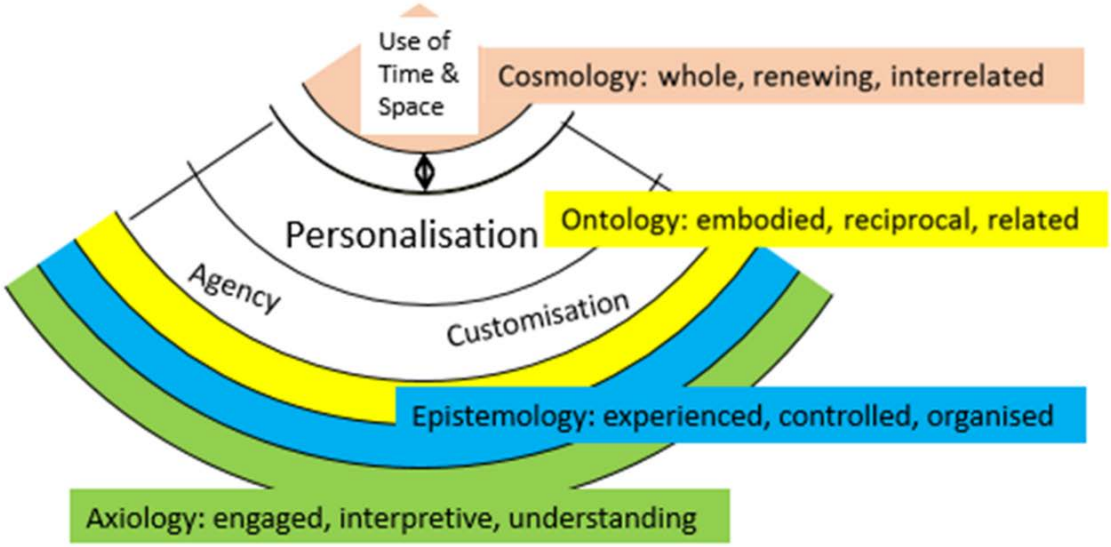

Figure 7-11 Cultural philosophies critiquing the construct of personalisation

I refer again to control over place, pace and time, and relate this to cosmology (see 7.2.3.1). Pre-service teachers frequently mentioned that using mobile devices empowered them to have freedom to choose a place in which to study and enabled

them to have flexibility in deciding when they would study. This could be sitting in a parked car while a child was at sports training, or at a beach, or late at night when other family members had gone to sleep. These multifarious ways of studying that are integrated into the ordinary and extraordinary events of daily life are indicative of the cosmological view of all things being interrelated (as discussed in 3.5.1). Arbon (2008, p. 32) asserted "the necessary obligations to maintain this wholeness through ceremonies and life" and "visiting the *wadlhu* [country] is critical as it affirms relatedness to entities and the importance of the *Ularaka* [Dreaming] to each individual as an *Arabana Nharla* [Arabana person]". Thus, the ability to travel and use mobile devices in many places is congruent with the cosmological obligation to visit places.

In addition, for Aboriginal and Torres Strait Islander people there is an inseparable link between cosmology and epistemology, in that certain learning can only occur or best occurs in certain places. One student drew parallels between these features of learning and the use of mobile devices:

> Definitely indigenous people – where you're learning or where you're doing something has a big impact. For example, when I'm teaching my kids something we go to a certain place – so we learn about using spears and nets and different things in different places. That's just a brief way of saying that being in certain places is better for learning certain things. So by being mobile, having a mobile device could enhance learning by being in the best place to do it. (Participant 6, 360–377)

Furthermore, another student mentioned the importance of tranquil places for understanding:

> If I had a laptop I could choose anywhere I'd like to study. And sometimes, it would – I could be on a beach. I think sometimes if you can put yourself in a place, that's, very very tranquil, where you can allow your mind to free associate, you'll find that you'll get more clarity. Yeah. I think being stuck in four walls it can have its limitations. I think sometimes, I know when I've had, you know, that light, that light bulb moment, it hasn't been (laugh) it hasn't always been in the classroom! It's been you know, when you're sitting down on the beach, relaxing, and you're taking in everything, and suddenly, I think because you're in a relaxing environment, it tends to stimulate you a lot easier, I think. Because you're not, you're not, you're not feeling overwhelmed, and tense to perform. You're actually in an environment that's calmed you down and allowed you to, allowed your thought processes to develop more readily, you know, like, not cramped, I suppose. (Participant 9, 377–497)

These sentiments about the use of mobile devices outside align with Arbon's (2008, p. 32) affirmation that using names, visiting places, speaking vernacular, listening to stories and other activities "are the engaged dialogic moments in our lives that arise from *wadlhu* [country], *wibma* [story] and *kurruna* [spiritual essence] to provide

knowing and understanding of our identity and existence".

Agency can also be perceived as aligning with the ontological feature to be embodied. This may include both the physicality of being in specific places for certain learning, as mentioned above by the student, and the proleptic embodiment discussed earlier in section 7.2.3.1. Agency could also be seen as congruent with the epistemological feature of knowledge being controlled, as students use mobile devices to control the times and places of learning. At the axiological level, the notion of being engaged aligns with agency as it is achieved through the intentional use of mobile devices.

Customisation of both mobile devices and a person's study activities may be seen as congruent with the ontological feature to be embodied. The notion of embodiment in learning is reinterpreted by the constant access of people to their mobile devices, so that the device almost becomes a part of a person's body. Three participants said the mobile device was constantly in their hands:

> It's always with me in my hand … it's right there in my hand. (Participant 32, 92–95)
>
> A small device is good because it is in your hand all the time. (Participant 33, 196)
>
> It's in your hand, (Participant 7, 426)

The close association of mobile phones with a person's body and the quasi-extension of a person's finger when using touch screens is indicative of an intimacy between the body and the device, as expressed by Ibrahim (2015, pp. 46-47):

> The age of convergence crafts the corporeal body as a site of technological habitation, where the physiological and cognitive abilities to watch, consume and remember images become somewhat elongated through technology. … The leap of media technologies from a domestic setting to the corporeal body makes technology intimate with our movements, pace of life, sensorial and aesthetic senses.

Ibrahim (2015, p. 52) talked about "the mobile body embedded with technology", and this disrupts and reinterprets the idea of embodiment. These notions are stretched further through the work of Hultman and Lenz Taguchi (2010) and their concepts of relational materialism, assemblages, intra-activity, diffractive seeing, nomadic thinking, things that emerge in-between, and becoming. Allen (2015, pp. 125-126) utilised some of these concepts to explore "human-non-human entanglements" or human and "more-than-human" assemblages regarding students and mobile phones. With regard to one of her subjects, she noted the blurring of the distinction between the body and the device:

> The phone is so much part of Hannah (or, the boundaries between her body and the phone are blurred, that she does not need to acknowledge it either by discarding it to have her photo taken, or looking at it to use it). Such corporeal accommodation of her cell phone may indeed make its presence harder to analytically discern (Allen, 2015, p. 129).

Allen (2015, p. 130) further suggested that "the boundaries between young people and mobile phones (i.e., the human-non-human) … [are] porous". This discussion has reinterpreted common understandings of embodiment of learning, yet presents these as being congruent with Aboriginal and Torres Strait Islander ontology.

These aspects of agency and customisation also relate to the epistemological feature of learning as experienced, and the axiological feature of learning as interpretive, engaged and generating understanding.

7.2.4 Summary

The model of the theory of the enhancement of professional learning includes four elements: the context, precursors, a catalyst and the educational use of mobile devices. This section addressed the nature of the catalyst for the uptake of mobile devices in tertiary study by Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. The catalyst was seen to be the alignment between the features of mobile learning and Aboriginal and Torres Strait Islander cultural philosophies. A pedagogical framework of mobile learning by Kearney et al. (2012) which identified three key features of authenticity, collaboration and personalisation was examined in relation to aspects of Aboriginal cultural philosophies – cosmology, ontology, epistemology and axiology – as described by Arbon (2008). The congruencies between the two explain the popular adoption of mobile devices by Aboriginal and Torres Strait Islander people for both social and educational uses. No-one has forced Aboriginal and Torres Strait Islander people to purchase and use mobile devices, yet there has been a spontaneous, massive embracement of mobile devices, which appears to be driven by cultural fit.

These first two sections of this chapter have focused on a theory of the enhancement of professional learning through the use of mobile technologies for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities and on description of the catalyst for such educational use of mobile devices. The next section of the chapter does not discuss the findings of the data per se, but discusses the conduct of the research. It does this by considering the role of the researcher and respectful, responsible relationships.

7.3 A contribution to the orientation of the researcher

I suggest that a researcher is obligated through ethical considerations to examine not only the findings of the data, but also to scrutinise the assumptions underlying the research and the conduct of the research. As indicated in both Chapter 1 and Chapter 3, as well as at the start of this chapter, the role of a non-Indigenous researcher with Aboriginal and Torres Strait Islander people is subject to critical examination. A pertinent question for me is "How can I act in such a way that my involvement in research could be acceptable to Aboriginal and Torres Strait Islander people?" In this section I indicate three wellsprings for my thoughts about a researcher's relationships with research participants. I focus first on the work of Karen Martin (2008), which addresses the agency of Aboriginal people's regulation of outsiders and the implications of this for researchers. Second, I provide a brief survey of ancient Greek texts relating to the term "ο παρακλητος" / *o paraklētos* / *the paraclete*. I then give a short explanation of similar terms among Pitjantjatjara and Yankunytjatjara people. Finally, I seek to integrate these in order to create a *Jarwon – Malpa – Paraclete* orientation.

7.3.1 Jarwon

Karen Martin (2008, p. 32) described her situation of being an Aboriginal researcher working with Aboriginal and Torres Strait Islander people from a different First Nation: "It also highlighted another complexity in that whilst being Aboriginal, I am an Outsider seeking to work with Rainforest Aboriginal *People* in their Country. … In short, I wondered what sort of researcher I would be" [emphasis in the original]. That too, is my question, and so I wondered what possibilities Martin's work suggests for a researcher like me.

Martin's research was in the context of the Kuku-Yalanji nation's desire to manage land, visitors and tourists. As an outsider, Martin (2008, pp. 33-34) had several questions in approaching her research relating to:

- her behaviour as a Noonuccal, Quandamoopah woman on Kuku-Yalanji country with the Burungu people
- elements of her Quandamoopah worldview to be used to guide respectful behaviour
- her reception and regulation by the local people
- her treatment by the Kuku-Yalanji as a template for regulation of other outsiders
- implications for people doing research with Aboriginal people.

As the research progressed Martin (2008, p. 9) noted:

> The Burungu, Kuku-Yalanji have always exerted agency in the regulation of Outsiders and this is theorised in three forms of relatedness: *ngarrbal* meaning 'stranger' is an Outsider who is unknown; *waybal* meaning 'whiteman' is an Outsider who is known about, and *jarwon* meaning 'friend' is an Outsider who is known.

According to Martin (2008, pp. 114-116), Kuku-Yalanji people had two processes of regulating *ngarrbal:* indirect regulation (without personal interaction) and direct regulation (with face-to-face interaction); both are brief and temporary. So too, they regulated *waybal* who had come and stayed amongst them through processes of limited interaction and limited engagement.

Martin (2008, p. 117), stated:

> So researchers are regarded as *waybal* because while Burungu Bama [the people of the place called Buru] know about them, they [the researchers] make short to mid-term visits over time, and then they leave. They're not expected to stay or engage in economic and cultural relatedness and that makes them 'intellectual tourists'. This is a form of limited interaction because the way Bama regulate researchers is reactive and on a case-by-case basis.

More generally, Martin (2008, pp. 121-122) identified that "the evolvement of *waybal* to *jarwon*, the coming amongst to coming alongside happens" when Outsiders regulate their own behaviours and fulfil conditions of honesty, co-operation and respect. She emphasised that "the processes of 'coming alongside' occur as relatedness is expanded, strengthened and deepened from that of *waybal* (being known about) to *jarwon* (being known)" (Martin, 2008, p. 127). For herself, Martin (2008, p. 128) reflected, "The transformation from *waybal* to *jarwon* occurred within the later phases of the research study and after working alongside Mr Fischer [an elite interviewee as a cultural elder]". This required her to exhibit integrity ("have a good heart"), honesty ("have a good word"), diligence ("work hard"), generosity ("don't be greedy") and humility ("avoid arguments") (Martin, 2008, p. 128).

Martin (2008, p. 130) stated that "the term 'respect' is an essential feature for establishing and maintaining relatedness amongst and alongside Aboriginal *People*" [emphasis in the original]. Martin prepared protocols for research and listed rules for showing respect with regard to seven aspects belonging to the participants: land, laws, elders, culture, community, families and futures. She emphasised the researcher needed to take responsibility for keeping those rules and specified 12 strategies for achieving researcher self-regulation (detailed in section 5.3.2) (Martin, 2008, pp. 130-133).

In response to the question “Can a non-Aboriginal / non-Indigenous person do Indigenist research?” Martin (2008, p. 140) responded, “In short, the answer needs to address the capacity to fully, respectfully and safely use Aboriginal terms of reference whilst at the same time, undertake continuing processes of self-reflexive interrogation”. She suggested “Since this research study claims the notion of Outsiders is unsubstantiated then the implication for researchers are to establish relatedness and work through the phases for ‘coming amongst’ and then ‘coming alongside’ as the relatedness is maintained and deepened” (Martin, 2008, p. 141). She concluded that “with relatedness as the premise and impetus, there is no such thing as Outsider, or Other, but of Another” (2008, p. 148).

The idea of “coming alongside” was familiar to me, and the next section explores nuances of a term in another language from a different part of the world.

7.3.2 Paraclete

When reading Martin’s work, I realised that I knew a term in a different language that meant “coming alongside”. From my Christian theological studies, I was aware of a term in the Greek New Testament: ο παρακλητος / *o paraklētos* / *the paraclete* [Greek / formal transliteration / common transliteration]. Linguistically, the noun *paraklētos* is referred to as the passive adjective of the verb *parakalein* (i.e. “to call alongside”). A person called a *paraklētos* has been seen as “one called alongside to help” (R. E. Brown, 1967, p. 116). I wondered about the possibility of a link between Martin’s researcher who comes alongside, and ideas about a *paraclete* who is called alongside. Two sections follow. The first looks at uses of ο παρακλητος in ancient Greek texts and the second looks at use of the term in the New Testament.

7.3.2.1 ο παρακλητος – ancient Greek texts

This section briefly covers five areas: instances of the term being used prior to the first century Common Era (CE), uses in the Septuagint (Greek translation of the Hebrew Old Testament and some related texts), uses by Philo (a contemporary of Jesus), a dissenting scholar’s views and common understandings.

In the most ancient Greek texts, the term is rare, “occurring in no more than 15 passages prior to and including the first century CE, not including the references in John and 1 John [in the New Testament]” (T. G. Brown, 2003, p. 170). Investigation of Greek uses of *paraklētos* in the fourth and third centuries Before the Common Era (BCE) indicates that the term could be used of a person who supported or sponsored another who needed help in a legal situation. However, this was not a technical term for a person with a specified job or office within the legal system.

There are also notions of a patron or broker (T. G. Brown, 2003, pp. 171-175; Grayston, 1981, pp. 70-75; Tuppurainen, 2006, p. 132).

Over the next centuries, the Hebrew Old Testament and some related works were translated into Greek in what is called the Septuagint. Scholarly consensus is that the first portion to be translated was the Torah – the five books of Moses, also called the Pentateuch. Aspects of linguistics and early citations

> indicate that the time the Pentateuch was completed is almost certainly the third century B.C.E. [Other portions were added with the result that] many translations existed by the late second century B.C.E.,[while] others were not completed until as late as the first century C.E." (Aitken, 2015, pp. 3-4).

The term *paraklētos* itself does not occur in the Septuagint, but the plural form *paraklētoi* is used once and has the sense of comforters. The word *parakalein* is used 61 times and gives meanings of "to comfort" or "to console" (T. G. Brown, 2003, p. 171; Tuppurainen, 2006, p. 133).

In the first century CE, Philo, a Jewish philosopher who lived in Egypt, used the word *paraklētos* in his writings, where it appears to have multiple nuances. In some texts the emphasis is on someone with a legal function, and in others it aligns more as a supporter or perhaps a sponsor (T. G. Brown, 2003, pp. 175-180; Grayston, 1981, pp. 72-74; Tuppurainen, 2006, p. 133). In Roman and other Mediterranean cultures of the era, a broker sometimes acted as a go-between to link patrons and their clients. One scholar, T. G. Brown, (2003, p. 181) stated, "I submit that in most of the texts we have studied the word παρακλητος would be best translated 'mediator' or 'broker'".

In contrast to the general consensus that the term does not identify a legal officer, Shelfer (2009, p. 131) argued that *paraklētos*

> … is a precise calque for the Latin legal term advocatus, meaning a person of high social standing who speaks on behalf of a defendant in a court of law before a judge. When Greeks came into contact with the Roman Empire during the late Republic, the word παρακλητος was developed as a precise equivalent to the Latin legal term advocatus.

It appears that in the small number of pre-Christian Greek texts where it occurs, nuances of the term παρακλητος include friend, helper, supporter, comforter, sponsor, broker, patron and legal advocate.

7.3.2.2 ο παρακλητος – New Testament usage

The term παρακλητος appears five times in the New Testament: four occurrences in the Gospel of John and once in the letter called 1 John. There is an extensive

literature on each of these (Porter & Gabriel, 2013). It is not possible to refer to all of it here, and only brief comments will be made about the New Testament usage of παρακλητος to gain further nuances of the term. The night before Jesus was killed he shared a meal with his disciples, and gave them his last major block of teaching. This is called the Farewell Discourse of Jesus and is recorded in the Gospel of John, chapters 13–17. Four times within this segment, Jesus spoke of the third person of the Trinity (i.e. the Holy Spirit) and called the Holy Spirit "*o paraklētos*". I refer to the first time Jesus used the term – John 14:16–17 – and present the Greek text:

> 16 κἀγὼ ἐρωτήσω τὸν πατέρα καὶ ἄλλον παράκλητον δώσει ὑμῖν ἵνα ᾖ
> μεθ' ὑμῶν εἰς τὸν αἰῶνα, 17 τὸ πνεῦμα τῆς ἀληθείας

The Greek text has been translated differently over the years. Several English versions are presented below to indicate the variety. The first is given as a full text, and others simply list the key term:

> 15 If you love me, you will obey my commandments. 16 I will ask the Father, and he will give you another Helper, who will stay with you forever. 17 He is the Spirit, who reveals the truth about God. (The Good News Bible, 1966)

The relevant term in the passage is ἄλλον παράκλητον / *allon paraklēton*, which is translated in different versions of the Bible as follows:

another Comforter … (The Authorised Version / King James Version, 1611)
another Counsellor … (The Revised Standard Version, 1946)
another advocate … (The New International Version, 1973)
another Friend … (The Message, 1993)

The range of terms used pick up various nuances described earlier about the pre-Christian Greek texts. A key point is that Jesus used the phrase ἄλλον παράκλητον / *allon paraklēton* / another paraclete "apparently intending himself as the *other* Paraclete" [emphasis in the original] (T. G. Brown, 2003, p. 191). If Jesus called the Holy Spirit "another" *paraclete*, then he was referring to himself as the first or template *paraclete*. Thus to understand the *paraclete*, it is necessary to understand the role and relationship Jesus had with his disciples.

Christian theology commonly portrays Jesus as part of the Trinity of God the Father, Son and Holy Spirit. As God, Jesus is eternally existent and distinct from the creation. Jesus also became a human – this is referred to as the incarnation. In the New Testament, Jesus, in his public ministry of three and a half years, is presented as one who came amongst and came alongside people in the ordinary affairs of their daily

lives. He had deep relationships with a small group of people, living together as a roaming band or micro-community. He shared their life situations and entered into their lived experiences, both the physical realities and the emotions of ordinary life of Roman-occupied Palestine.

One New Testament passage describes the basis for the relationships Jesus had with those around him, and considers this an example for Christians to emulate: Philippians 2:5-8 (The New International Version, 1973):

> [5] In your relationships with one another, have the same mindset as Christ Jesus: [6] who, being in very nature God, did not consider equality with God something to be used to his own advantage; [7] rather, he made himself nothing by taking the very nature of a servant, being made in human likeness. [8] And being found in appearance as a man, he humbled himself by becoming obedient to death – even death on a cross!

These characteristics might be termed self-emptying, humility, obedience and sacrifice. In one sense, Jesus could be called the ultimate Outsider, and one who is truly Other, yet, in becoming human, he became Another – like men and women.

As I had lived with Pitjantjatjara and Yankunytjatjara people in the early 1980s, and as all the South Australian research participants spoke these languages, I was interested to investigate how notions of coming alongside and friendship were expressed. The following section briefly identifies key terms.

7.3.3 Malpa

My background among Pitjantjatjara people as a school teacher in the early 1980s at the time AnTEP commenced enabled me to identify terms used by Pitjantjatjara and Yankunytjatjara people that are parallel to the Kuku-Yalanji ones used by Martin. The key terms are as follows: *malikitja* means “stranger”; *walypala* is a phonetic pronunciation of “white fella” (from “white fellow”) and a vernacular term is *piranpa* (related to a word in Yankunytjatjara for “moon” and indicating a white colour); and *malpa* means “friend”.

I recalled how I had sought to “come amongst” and “come alongside” Pitjantjatjara and Yankunytjatjara people in the early 1980s. My approach included many of the 12 rules specified by Martin (see section 5.3.2) as I endeavoured to embody reciprocal respectful relationships. I was privileged to be welcomed by local people and helped to start to learn the Pitjantjatjara language, customs and beliefs, and to visit various places. They encouraged me not to remain as *malikitja*, *walypala* or *piranpa*. It was an honour to be recognised by local people as a *malpa* / friend, and incorporated into *walytja* / family.

I had a mixture of trepidation and excitement about returning to the APY Lands after being away for 27 years. I expected that for many people I would be simply another *malikitja*, *walypala* or *piranpa*. However, I hoped I would remember people and that they would remember me. I hoped they would welcome me again, and that for those who knew me before, I could again be a *malpa*. I hoped too, that over the years of the doctoral research, I could become a new *malpa* to others.

I wanted to travel with them – walking or driving around their communities – and sit with them to discuss the interview questions and to yarn together. I hoped that when I went to Queensland, I would quickly get on well with people there, despite having no previous personal relationship.

The following section seeks to integrate Martin's ideas about someone who comes alongside and becomes a friend with the ancient Greek term ο παρακλητος as well as with Pitjantjatjara and Yankunytjatjara concepts and so articulate a *Jarwon – Malpa – Paraclete* orientation for researchers.

7.3.4 Jarwon – Malpa – Paraclete orientation

7.3.4.1 Integration

Martin pointed to the primacy of relationships that enable the researcher to move beyond "coming amongst" to "coming alongside", and to be ascribed the status of a known friend who is no longer Outsider or Other but Another. Table 7-1 sets out similar terms in four languages.

Table 7-1 Parallel terms expressing Karen Martin's concepts relating to Aboriginal people's agency of outsiders

Concept	**English**	**Kuku-Yalanji**	**Pitjantjatjara**	**Greek**
an Outsider who is unknown	stranger	ngarrbal	malikitja	allotrion / xenos
an Outsider who is known about	whiteman	waybal	walypala / piranpa	gnorimia
an Outsider who is known	friend	jarwon	malpa	philos
one who comes alongside	companion			paraclete

How might these cultural perspectives of "coming alongside" be integrated for a researcher, particularly a non-Indigenous person working with Aboriginal and Torres

Strait Islander people? In both, there is a fundamental premise of deep relationships and a priority to enhance these relationships. The key characteristics appear to be respect towards partners in the relationship and humility towards self. It is imperative that the Outsider/researcher move to the place of the locals, for it is only there that "coming alongside" can happen, relatedness be established and transformation towards friend/Another can occur.

Martin (2008, p. 117) speaks of *jarwon*, a known friend:

> *Jarwon* are regulated by Bama [local people] through sustained engagement and this is maintained by both groups over time … Another way Kuku-Yalanji showed the depth of this sustained engagement was to take the surname of the 'boss' as theirs. … it's a way Bama included the 'boss' into their family and their Country and their relatedness.

In effect, this makes the Outsider kin. Among Aboriginal and Torres Strait Islander groups it is not uncommon for a non-local friend of good standing to be affiliated with a family and ascribed status as kin. Indeed, for many Aboriginal and Torres Strait Islander groups, it is imperative that this happens so that people know how to relate to this non-local person. This practice can occur among Pitjantjatjara and Yankunytjatjara people, so that a *malpa* / friend can be placed into a *walytja* / family.

In the New Testament Farewell Discourse, Jesus speaks of his disciples in notions of family relationships. He talks of the disciples going to his Father's house/family, that he and the Father will make their home with them and that the disciples will not be left as orphans. Brown (2003, p. 204) pointed out:

> These all recall the family imagery [earlier in the Gospel of John, in which] … Jesus gave believers power to become God's children, a 'spiritual' family. Arguably, the most dominant ideal associated with Mediterranean kinship, whether actual or 'fictive', is family loyalty, maintaining family honor and staying 'connected'.

This focus on creating family relatedness is a feature of *jarwon*, *malpa* and *paraclete*.

The *paraclete* also bears ideas of friend. In another passage in the Farewell Discourse, Jesus says, "I have called you friends, for everything that I learned from my Father I have made known to you" (John 15:15, The New International Version, 1973). Given this commonality regarding both family relatedness and friendship, I propose that a researcher should act in such a way through "coming amongst" and "coming alongside" that the participants deem him or her to be worthy of being ascribed the status of j*arwon* or *malpa*. The term *paraclete* adds other aspects such as helper, supporter, comforter, sponsor, broker, patron and legal advocate. I suggest that as a relationship between researcher and participants develops over

time, then it is possible that some of these elements might also be expressed.

I advocate combining these cultural terms, so that a researcher could adopt a *Jarwon – Malpa – Paraclete* orientation. Together, these terms exemplify the conceptual strengths of ancient cultures, and conjoined, demonstrate visibly and linguistically the cross-cultural process of “coming alongside”.

Martin suggested that the Kuku-Yalanji people’s preference was that a person who was different from them would “come amongst” and “come alongside” them in respectful ways, so that the Kuku-Yalanji people could ascribe to that person the status of *jarwon* / friend. In so doing, she indicated that notions of Outsider or Other could be abolished, and mutuality established. This is a significant philosophical and phenomenological concept, but there is not space here for discussion. Nevertheless, as an example of these sentiments, I turn to the lyrics of a song.

In the early 1980s, I was living on the APY Lands when an Aboriginal rock band from the Northern Territory, called “Warumpi Band”, started to become popular. In 1984, they produced an album which included the song "Blackfella/Whitefella". This song expresses the desire for people, regardless of differences, to relate to one another as a “true fella” or “real fella”. The lyrics also mention the hope that people will “always [be] ready with a helping hand” to assist anyone. In the song there is a longing for people to be incorporated as brothers and sisters in one family. One version of the lyrics (from a performance broadcast live on a music video TV program) is reproduced below (Warumpi Band, 1987)

> Black fella, white fella
> It doesn't matter, what your colour
> As long as you, a true fella
> As long as you, a real fella
>
> All the people, of different races
> With different lives, in different places
> It doesn't matter, what your name is
> We got to have, lots of changes
>
> We need more brothers, if we're to make it
> We need more sisters, if we're to save it
>
> Are you the one who's gonna stand up and be counted?
> Are you the one who's gonna be there when we shout it?
> Are you the one who's always ready with a helping hand?
> Are you the one who understands these family plans?

7.3.5 Summary

As a non-Indigenous person, I am seeking to find an orientation as a researcher with Aboriginal and Torres Strait Islander people that can be endorsed by Aboriginal and Torres Strait Islander people. As a foundation, I have my relationship as a *malpa* with Pitjantjatjara and Yankunytjatjara people. Martin's experience as an Outsider and Aboriginal woman conducting research with people from a different Aboriginal nation provides an opportunity for me to think further about what it means to "come alongside". The ancient Greek term *paraclete*, in both secular and early Christian usage, adds richness to expressions of "coming alongside". The terms *jarwon*, *malpa* and *paraclete* inherently assume the development of strong relatedness through the process of "coming alongside". Hence I suggest that for me, a suitable orientation as a white researcher among Aboriginal and Torres Strait Islander people is to be known as "the researcher who comes alongside", that is, one who embodies a *Jarwon – Malpa – Paraclete* orientation.

7.4 Conclusion

This chapter was structured with three main parts. In the first part, I proposed a theory of enhancing professional learning through the use of mobile devices for Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. I outlined a four-part framework which included context, precursors, catalyst and the educational use of mobile devices. Based on a constructivist Grounded Theory approach, I presented nine categories leading to the concept of enhancing professional learning, which I stated is a particular case of the concept of repositioning identity. I set out nine propositions that constituted the theory of enhancing professional learning through the use of mobile devices. I suggest that completion rates for community-based ITE programs in very remote communities may improve through the use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers.

In the second part of the chapter, I presented an explanation for the widespread use of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers in very remote communities. I used elements of Aboriginal and Torres Strait Islander cultural philosophies, such as cosmology, ontology, epistemology and axiology to interrogate a pedagogic framework of mobile learning, which contained the three features of authenticity, collaboration and personalisation. Congruencies exist between cultural philosophies and elements of mobile learning. I believe these alignments provide the rationale for the spontaneous embracement of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers in very remote

communities. I suggest that mobile devices fit with Aboriginal and Torres Strait Islander cultural perspectives.

For the third part of the chapter I moved away from analysis of the data and discussed the role of the researcher with Aboriginal and Torres Strait Islander people. I juxtaposed concepts from differing ancient cultures. The first was an Aboriginal concept of “coming alongside”, which transforms someone from an unknown Outsider to a known friend. The second was an ancient Greek concept of the *paraclete*, which contains ideas of someone called alongside. The third illuminated these among Pitjantjatjara and Yankunytjatjara people. I suggest the parallel concepts in cultural terms express an orientation for a researcher which embodies reciprocal respectful relationships. I believe this is particularly appropriate for non-Indigenous researchers working with Aboriginal and Torres Strait Islander people. I termed it a *Jarwon – Malpa – Paraclete* orientation.

The last chapter of this thesis reviews the key findings and matters of discussion and identifies the original contribution to the field and the new knowledge which has been generated through this research; it also points to implications and proposes recommendations for stakeholders involved in community-based ITE programs with Aboriginal and Torres Strait Islander pre-service teachers in very remote communities.

8 CONCLUSION

The title of this thesis is “Travelling together and sitting alongside: How might the use of mobile devices enhance the professional learning of Aboriginal and Torres Strait Islander pre-service teachers in remote communities?” The research is located within the field of higher education in Australia. It investigates the perceptions and practices of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities about the use of mobile devices while studying ITE through community-based programs.

This chapter summarises the contributions to knowledge that have been made through undertaking the research, proposes recommendations for ITE providers and makes suggestions for further research. In accord with the phronetic approach adopted for this research, I share reflections on personal insights gained during the study. I then present a concluding statement.

8.1 Contributions to knowledge

This research contributes new knowledge in four areas: the beliefs regarding and behaviours about the use of mobile devices in ITE study of Aboriginal and Torres Strait Islander pre-service teachers in very remote communities and Other sites; a theory of enhancing professional learning through use of mobile devices; a model explaining adoption of mobile devices due to alignment of cultural philosophies and mobile learning; and a theoretical and methodological orientation for researchers. Each of these are briefly summarised.

8.1.1 Mobile devices use by Aboriginal and Torres Strait Islander pre-service teachers

This research charts new ground by collecting data about the perceptions and practices of Aboriginal and Torres Strait Islander pre-service teachers in two community-based ITE programs with respect to the use of mobile devices in their tertiary study. This topic had not previously been investigated in either community-based ITE program, and neither had the two programs been examined concurrently. The research addresses four key questions. The first explores educational uses of mobile devices; the second considers andragogical issues; the third looks at matters of speed of study and completion; and the fourth investigates aspects of cultural philosophies and elements of mobile learning. The major finding from the first research question is that the majority of participants used or would like to use mobile

devices for accessing content, handling administration, sharing personal encouragement and collaborating for academic support. The major finding from the second research question is that the majority of participants used or would like to use mobile devices to empower them to be self-directed in their learning regarding time and place of study. The major finding from the third research question is that the majority of participants believed the use of mobile devices enabled them to finish their study faster. The major finding from the fourth research question is that the majority of participants made statements aligning use of mobile devices with at least one aspect of cosmology, ontology, epistemology or axiology. The first three findings are congruent with and augment the existing literature, which promotes a range of educational uses of mobile devices, endorses the affordances of mobile devices for the complex lives of adults and advocates the use of mobile devices to speed up progress of study. This research significantly adds to the knowledge in these three areas in three ways, because it investigates (1) a defined cohort, that is, students in community-based ITE, (2) a particular set of participants, that is, Aboriginal and Torres Strait Islander people, and (3) a specific context, that is, geographical remoteness. The fourth finding is unique and is discussed in 8.1.3.

8.1.2 A theory of enhancing professional learning through use of mobile devices

This research contributes new knowledge by proposing a constructivist Grounded Theory of enhancing professional learning through use of mobile devices. No other theory has explicitly demonstrated the impact of the educational use of mobile devices on enhancing professional learning for Aboriginal and Torres Strait Islander pre-service teachers. The creation of the categories in the theory accords with both the research data and the literature and uniquely describes the ways in which these categories interrelate. Construction of the theory involved intentionally coding interview transcripts to highlight actions and sequences and then attributing abstract meanings. Following this, similar codes were collated into categories. Relationships between categories were examined in order to identify a core concept. The theory suggests three elements affecting the educational use of mobile devices in tertiary study: life context, precursors and a catalyst for the uptake of mobile devices. The postulation of a catalyst is itself an original contribution to knowledge and is discussed at 8.1.3. The theory of enhancing professional learning through use of mobile devices details how three sub-categories of Fostering Access, Facilitating Customisation and Promoting Collaboration together form the minor category of Supporting Relevance, which facilitates a main category of Completing the Course. The theory also incorporates two minor categories of Providing Freedom and

Enabling Flexibility which contribute to a second main category of Empowering Agency. The third main category of the theory is Enabling Social Networking. Together, these three main categories constitute the core concept of Enhancing Professional Learning through use of mobile devices. Furthermore, it is proposed that this core concept is a specific example of a larger concept termed Repositioning and Forming Identity.

8.1.3 Alignment of cultural philosophies and mobile learning

This research also makes an original contribution to the field of adoption of technology by articulating a model accounting for the popular adoption of mobile devices by Aboriginal and Torres Strait Islander people, with reference to alignment between aspects of cultural philosophies and elements of mobile learning. Within the theory of enhancing professional learning through use of mobile devices (summarised in 8.1.2), this is seen as a catalyst to the uptake of mobile devices for educational purposes by Aboriginal and Torres Strait Islander pre-service teachers. Some theorists and researchers have identified features of mobile learning, while others have referred to characteristics of culture and the adoption of technology. Those in this latter area often use constructs of culture based on notions of national identity. There are no other studies of which I am aware that have focused on the philosophic underpinnings of cultures. This is the first study to describe the alignment of features of mobile learning with the cosmology, ontology, epistemology and axiology of Aboriginal and Torres Strait Islander people.

As a non-Indigenous person I rely extensively on the work of Aboriginal and Torres Strait Islander academics, particular Karen Martin (2008) and Veronica Arbon (2008). In so doing, I recognise the danger of appearing to ignore the diverse subjectivities of various First Nations and do not attempt to impose an imagined essentialism nor assert to be an “all-knowing patriarchal white subject” (Moreton-Robinson, 2011, p. 416). Neither is this a form of cultural appropriation. Rather, I seek to affirm the rich commonalities that exist and which unite Aboriginal and Torres Strait Islander peoples. In my phronetic approach to the research, my analysis of interview transcripts intentionally seeks to highlight aspects of cultural philosophies which are important to the participants.

Taking Aboriginal and Torres Strait Islander philosophies as foundational, I use these to critique a pedagogical perspective of mobile learning outlined by Matthew Kearney et al. (2012). They identified three main features of mobile learning: authenticity, collaboration and personalisation, within fluid space and time contexts. I examine this pedagogic framework in the light of existing cultural philosophies that

are dominant in the lives of Aboriginal and Torres Strait Islander people. I argue there is alignment or congruency between the two. This alignment is the catalyst that instigates both the broad appeal of mobile devices among Aboriginal and Torres Strait Islander people generally, and, specifically, prompts the voluntary utilisation of mobile devices and embracement of mobile learning within the context of professional learning by Aboriginal and Torres Strait Islander pre-service teachers in very remote communities studying ITE through community-based programs.

8.1.4 Jarwon – Malpa – Paraclete orientation

This research proposes a unique perspective on the orientation of a researcher. It innovatively juxtaposes insights from two broad ancient cultures – Australian Aboriginal and Torres Strait Islander culture and Greek culture – and emphasises common perceptions regarding relatedness. The congruencies enable the creative construction of a *Jarwon – Malpa – Paraclete* orientation, in which the researcher is one who comes alongside and is viewed as a friend. This approach is novel. I know of no other studies which have investigated both ancient Greek and Aboriginal and Torres Strait Islander societies for the social and religious nuances of the interrelationships of strangers.

The theoretical and methodological stance for the doctoral research builds on the work of the Australian Aboriginal academic Karen Martin, who stressed the agency of Indigenous peoples regarding their interactions with outsiders. She theorised this with respect to relatedness, and identified three categories: *ngarrbal* / “stranger”, *waybal* / “whiteman” and *jarwon* / “friend” (Martin, 2008, p. 9). The status of *jarwon* / ‘friend’ can be conferred on an outsider researcher if the researcher demonstrates respect and seeks to establish and maintain relatedness by “coming amongst” and “coming alongside” local people. Martin averred that “with relatedness as the premise and impetus, there is no such thing as Outsider, or Other, but of Another” (p. 148).

Among Pitjantjatjara and Yankunytjatjara people parallel terms are: *malikitja* / “stranger”, *walypala* or *piranpa* / “whiteman” and *malpa* / “friend”.

An ancient Greek term: *ο παρακλητος* / *o paraklētos* / *the paraclete* – one called alongside – expands Martin’s ideas. In the small number of pre-Christian Greek texts where the term is mentioned, nuances of *παρακλητος* include friend, helper, supporter, comforter, sponsor, broker, patron and legal advocate. There are five uses of the term in the New Testament, one that appears to employ the last two nuances, and four that focus on the role of the Holy Spirit with reference to that of

Jesus with his disciples. In the New Testament, Jesus is described as one who 'came amongst' and 'came alongside' people in the ordinary affairs of their daily lives, sharing deep relationships with them. Theology generally presents Jesus as both divine and human. Jesus might be portrayed as the archetypical Outsider – one who is truly Other, yet, in becoming human, he became Another.

In writing the thesis, I foreground the congruencies between two broad ancient cultures with regard to the primacy of relatedness and the possibility of dissolving the label of Other/Outsider by affirming the commonality of Another, through "coming amongst" and "coming alongside". Thus I propose a *Jarwon – Malpa – Paraclete* orientation in which the researcher is located as someone who "comes alongside" and becomes a friend. This uniquely valorises two contemporary vernacular terms, while combining these with an ancient, richly nuanced term that carries a long history of theological discussion. I suggest that a *Jarwon – Malpa – Paraclete* orientation embodies strong intellectual tensile rigour. This may be explained by stating that the juxtaposition of concepts from differing cultures requires intellectual work to understand the original contexts of the terms and evaluate the degree of similarity between them. This juxtaposition also raises the extent to which the concepts and terms can be stretched to handle the stress of the new context into which they both have been placed. In addition, this juxtaposition necessitates determination of the capacity of the new term to be trustworthy in meeting the complexity of the role and relationships of non-Indigenous researchers among Aboriginal and Torres Strait Islander people. Moreover, it inherently assumes and demands the development of practical methods to foster relatedness between the researcher and the participants through the process of "coming amongst" and "coming alongside". In addition, it encapsulates the notion of "travelling together and sitting alongside" expressed in the title of the thesis – which can be applied both to the relationship of the researcher and participants, and also to the metaphor of a mobile device as a trusted companion constantly alongside. The orientation can be applied most readily to qualitative research in general. It is particularly apt in cross-cultural contexts, which are often sites of contestation regarding power, colonising practices, white privilege and enduring racism.

8.2 Recommendations for providers of community-based initial teacher education programs

I recognise that arising from this research there may be consequent implications for other stakeholders in Australian higher education, such as national, state and territory governments and their respective education departments – particularly

regarding Aboriginal and Torres Strait Islander workforce issues, statutory and regulatory bodies, non-government special interest groups, and philanthropists. However, in order to maintain a tight focus on the central concern of the research about community-based ITE programs, I leave it for those other stakeholders to contemplate the import and impact of the research. I first present a human rights perspective to the use of mobile devices and the internet, followed by Australian statistics about external students and the role of online studies before proposing recommendations for providers of community-based ITE programs.

The educational use of mobile device for enhancing professional learning must be seen in a global context. Mobile devices can be used on their own and can also be used with the internet. Access to and use of the internet is a matter of human rights, as expressed in the following points (United Nations, 2011, pp. 7, 17, 19, 22):

> 20. Indeed, the internet has become a key means by which individuals can exercise their right to freedom of opinion and expression, as guaranteed by article 19 of the Universal Declaration of Human Rights
>
> 62. Moreover, the internet is an important educational tool, as it provides access to a vast and expanding source of knowledge, supplements or transforms traditional forms of schooling. … Additionally, the educational benefits attained from internet usage directly contribute to the human capital of States
>
> 66. However … all States [have a] ... positive obligation to promote or to facilitate the enjoyment of the right to freedom of expression and the means necessary to exercise this right, including the internet
>
> 85. Given that the internet has become an indispensable tool for realizing a range of human rights … ensuring universal access to the internet should be a priority for all States. Each State should thus develop a concrete and effective policy … to make the internet widely available, accessible and affordable to all segments of population.

This platform of human rights should guide the actions of the 48 providers of ITE in Australia (The Australian Institute for Teaching and School Leadership, 2015, p. 5). There is a significant trend of increasing numbers of external students using online approaches: “Commencements from 2005 to 2013 by mode of attendance … show a steady increase in the number of students studying through external attendance, with external mode of attendance commencements recording a 93 per cent increase since 2005” (The Australian Institute for Teaching and School Leadership, 2015, p. 13). It behoves ITE providers to improve their approaches to online study and recognise the role of mobile devices within this. In Chapter 1, I outlined the context of the research and identified a problem, viz: the low completion rates of Aboriginal and Torres Strait Islander pre-service teachers in two community-based ITE programs. I propose the following recommendations in order to ameliorate the inefficiencies, funding dilemmas, and reputational predicaments that arise for ITE

providers due to slow progress and low completion rates in community-based ITE programs. This section identifies 10 recommendations clustered in three groups, relating to: pedagogy/andragogy (Recommendations 1–5), resources (Recommendations 6–8) and policy (Recommendations 9–10). These same groups of recommendations could be addressed respectively to lecturers and administrative personnel, then staff of the institution's Information Technology department, and lastly to senior personnel in the faculty of education and executives for the whole institution.

8.2.1 Recommendation 1: Ensure familiarity with online learning for students entering community-based ITE programs.

8.2.1.1 Rationale

There was a marked difference in responses between participants from RATEP and AnTEP. As mentioned, RATEP uses an online approach, whereas AnTEP did not. RATEP students' familiarity with online learning processes meant they initiated the integration of mobile devices into their learning. In contrast, AnTEP students' lack of expertise with online learning processes limited their utilisation of mobile devices for study purposes and constrained their ability to imagine such uses. Now that AnTEP has ceased, and with the prospect of mobile network services being available by mid-2018 in all the major communities of the APY Lands (Department of Communications and the Arts, 2015), it will be important for any subsequent tertiary programs in this area to ensure students are familiar with online learning. In 2012, RATEP instigated off-site learning in which students study without the resources and support of a mentor at a learning centre. These students primarily use mobile devices rather than desktop computers for their study. An evaluation in 2015 found "some offsite students requiring more training in the use of course-related online tools/programs than was expected" (TAFE Queensland North, 2015, p. 6). These observations are consistent with remarks by Baran (2014, p. 25) about how lack of expertise impacts on mobile learning uptake: "Lack of expertise integrating mobile technologies was also a challenge to effective integration of mobile learning into teacher education".

8.2.1.2 Implications

Providers of community-based ITE programs generally run a face-to-face residential induction/orientation course of up to two weeks at the start of each year. It would be appropriate for each ITE provider to ensure significant time in such a course was devoted to students being trained and becoming familiar with all aspects of online learning required in the course. This should include use of technology supplied by the institution (e.g. desktop computers, headsets, laptops, tablets, dongles, USBs,

CDs, DVDs). In particular, it should include use of the mobile devices owned by students, as (based on the research evidence) it is these that students will primarily be using to pursue their tertiary studies. It should also include familiarity with software and apps used by the institution, including the institution's learning management system.

Moreover, ITE departments need to continually monitor the needs and suggestions of students in the rapidly changing context of online learning and evaluate the approaches used by the ITE department. Furthermore, education departments within tertiary providers need to be actively involved in whole-of-institution discussions about strategies for mobile learning. They must respond to immediate needs and current trends, as well as proactively anticipate and prepare for future scenarios. The rest of the institution would naturally look to education personnel for expertise and to lead the way in these areas.

8.2.2 Recommendation 2: Enable students to access all content through mobile devices.

8.2.2.1 Rationale

Participants suggested the following seven strategies, which either increase a current practice or introduce a new one: (1) provide USBs, CDs and DVDs of web-conferencing sessions, in order to mitigate difficulties with connectivity and cost of connection to students, (2) set small assignments to be done online through mobile devices, (3) use ebooks, (4) provide podcasts, USBs, CDs and DVDs of recordings of lectures given to on-campus students, as well as continuing web-conferencing, (5) make available all subjects in the whole course at all times, (6) enable flexible starting and finishing times for all subjects in the course, and (7) design assessments to make use of the features of touch screens on mobile devices.

8.2.2.2 Implications

There will be relatively small costs associated with providing USBs, CDs and DVDs and posting these to students. Faculty will need upskilling on pedagogic/andragogic design of online material. Given the global trends towards online learning, it is likely that such professional development will soon be mandated as a whole-of-institution strategy, and costs will not be born exclusively by ITE departments. Similarly at an institutional level, the capabilities of learning management systems and ICT infrastructure will need to be enhanced, as online approaches become a key form of delivery and the major mode of access to resources. Administrative procedures will need to be restructured to enable provision of whole courses and continuous and flexible enrolment in modules of courses. Again, given international and

internationalising trends in online delivery, this is an institutional matter.

8.2.3 Recommendation 3: Facilitate administration through mobile devices

8.2.3.1 Rationale

Participants wanted existing administrative practices to continue as well as the following two approaches to be implemented. First, students requested staff give favourable consideration to requests for extensions regarding sickness, injury, funerals and cultural obligations – recognising that with the use of mobile devices, students are able to increase the pace of study when returning to study after a break. One student pointed out that study is not always first priority:

> I had three, four people die in a year and almost [quit] ... and I had to defer my exams for a couple of months or something. And I know that's what happens a lot with people. They need to take time off. They don't ... family comes first and their responsibilities and things like that. So it's hard to change that 'cause it's to do with the culture and ... to put study first when lots of things pop up in life that you just need to take time off. And that could be a reason why some people don't finish. (Participant 19, 305–310)

Another talked about changing the intensity of study after a break:

> But there's sort of times when you don't want to do stuff, and then there are times when you really do, and you can get through it quick. So you know, just times around death, and sickness for people really gets you down. But after that sadness, you might get a good run and get a lot of stuff done. …Yeah, you sort of put it [study] on hold, and then come back to it [using mobile devices] when you're ready. (Participant 6, 513–544)

Second, students would appreciate detailed induction, including specific training on changing the size of photos, video and audio recordings, merging files and uploading assignments from mobile devices. One student expressed both her frustration and her desire for training:

> [Uploading] it's a pain. 'Cause you can't do it with an iPad … they say "Oh you can take photos on your phone and email it" for an assignment, say for my maths assignments. I decided to do that, but then the files were too large. … The thing that I hate about this course is SENDING IN MY ASSIGNMENTS! because that takes HOURS! and when you're on a deadline, it's just like "Like HURRY UP!" Oh, the other thing is, I reckon that if you're going to be doing this type of study you need to get training … I think you actually need to do like a small, like a course of training of how you work all the technology: how to work around it all and find it or, you know … shrink files, do this do that, I, it's just so annoying. I don't even know … I ring up … [but] usually when you send off assignments or whatever, if you're running late, you know, it's like at night (laugh),so you can't really like really ring up the [ICT] dude [at the university]. I'd really love training in the technologies, any kind [emphasis in original]. (Participant 7, 610–613, 652–692)

8.2.3.2 Implications

Providers have procedures for requesting leave and extensions to assignments. Providers could exercise leniency regarding such procedures for students in community-based ITE programs. Particular attention could be given to providing prompt responses in ways that are accessible to students' mobile devices. Quick positive replies may alleviate concerns about study in what are already stressful situations for students. Staff could use mobile devices to contact students directly to negotiate new due dates. Aspects of the second request from students about administration noted here could be handled in the start-of-year induction. Additional assistance could be provided through appropriate guidelines and video tutorials posted online, which students could access at their convenience. Furthermore, revision and ongoing training on aspects of technology could be included at other workshops or residential courses throughout each year.

8.2.4 Recommendation 4: Offer personal encouragement to students through mobile devices

8.2.4.1 Rationale

Students mentioned being under pressure for various reasons, including sickness, study load, deaths and cultural obligations. Kinship often requires people to attend mourning activities in other places, sometimes many hundreds of kilometres away. These are commonly called "sorry business" or "sorry". In discussing a central Australian community, Musharbash (2008, p. 38) stated, "Sorry overrides all other concerns and the announcement of an adult death means that any ritual, work, or other activity will be interrupted immediately". Referring to the variety of practices across Australia, McKay and Tighe (2014, p. 114) pointed out that "different stages of sorry business can continue over several weeks and months, depending upon the person's familial relationship to the deceased". The rate of suicide for Aboriginal and Torres Strait Islander people aged 15–24 is more than five times that of their non-Indigenous peers (Dudgeon, Calma, & Holland, 2016), and the national age-

standardised death rate for Aboriginal and Torres Strait Islander people was 1.8 times that of non-Indigenous people (Australian Indigenous Health*InfoNet*, 2016a). Deaths occur relatively frequently among Aboriginal and Torres Strait Islander people. One student spoke of the expectation to attend funerals: “So Anangu way … just, you know, people got to travel on business, funeral and all … sometime you miss out, see, and then you can’t finish off doing AnTEP you know” (Participant 36, E33 1323–1324).

Students value support to cope emotionally with grief and other matters. One student stressed the importance of staff of the training provider showing genuine interest in students and empathy concerning issues students faced, saying this could be communicated through mobile devices by emails and phone calls: “It's all about that feeling stuff as well. It's not just, ‘Here is a room and here’s books … and away you go’, [but] empathy … ‘We’re working with you and for you too. We know how hard it’s been’” (Participant 15, 195–198).

8.2.4.2 Implications

Staff could be allocated as mentors to a small group of students within each cohort. If any member of staff receives information indicating a student’s need for personal encouragement, and without breaching confidentiality or causing personal embarrassment, then that staff member could notify all other staff, particularly the staff member designated as a mentor for that student. In addition, the mentor could pass on details to any student liaison officer or pastoral care worker. Staff could take the initiative to contact students through mobile devices to proffer personal encouragement to help the student cope with the immediate situation and resolve to persevere with study.

8.2.5 Recommendation 5: Increase academic support through mobile devices

8.2.5.1 Rationale

Pre-service teachers made suggestions to enhance academic support through mobile devices. One person suggested that staff could ring a student if needing to make negative or critical feedback on a student’s assignment: “Instead of just writing comments on the bottom of your assignment I think a phone call to back it up, or prior to giving you those comments … [would be] more professional … a little more personable I suppose” (Participant 25, 170–174).

Another student proposed using mobile devices to video ITE students in classrooms with school pupils during professional experience internships:

> Staying where you are and being part of your home community … you get people through quicker, with video to do their teaching and their pracs. So that the person in the city can see that you're competent. Rather than just hearing from someone who signs a form to say that you're competent, he can actually [see] … you can teach in the class, they can see that you can do it. (Participant 6, 825–871)

This accords with comments by West (2012, p. 12) about pre-service teachers using smartphones "to film themselves teaching a lesson or lesson segment. These video clips are then uploaded to a server where professors and peers can watch them at their convenience". Tablets have also been used for the same purpose: "The iPad proved itself to be a powerful 'all in one' device for recording and reviewing the teacher's own performance, aiding the development of reflective capacity" (Leggatt, 2016, p. 444). The implementation of the practice would require no further expense to institutions, assuming that ITE students have either their own or institution-issued mobile devices.

8.2.5.2 Implications

Staff could implement a standard procedure in which negative comments about a student's work are first made directly with a student, either face-to-face or by phone call to a student's mobile phone, prior to being sent in written or text form. This would require minimal expense and a small investment of time.

It is likely that most students will own a mobile device capable of recording video clips of them on their professional experience internships. If not, then the institution could liaise with the school at which the student is based to provide a suitable mobile device or perhaps arrange for the institution to loan one to the student. Uploading a video clip requires a lot of data. This would be a significant inconvenience to most students, as it would consume a large portion of their regular data allowance, thus hindering them from conducting other online activities. Institutions could arrange for students to use the ICT system of the school where they are based. Another solution is to offer students a prepaid data allowance for the duration of their professional experience internships, specifically for the purpose of uploading video clips of them teaching.

8.2.6 Recommendation 6: Provide unfiltered internet at learning centres

8.2.6.1 Rationale

Pre-service teachers expressed frustration that, as adults, they were unable to access course material recommended by their tertiary institution when at the learning centre, due to education department restrictions for minors (such as firewalls, filters and prohibited sites), which affect desktop computers and mobile

devices using the local area network (wired or wifi). The following quote expresses annoyance and appeals to recognition of the adult status of tertiary students:

> In RATEP we're on the Education Queensland computer system, and we have SO many blocks. … We were just getting Block, Block, Block, Block! … and most of our uni work is through YouTube! Some things we HAVE to do. … The students are at uni level and they need fairer restrictions [emphasis in original]. (Participant 7,890–919)

Using mobile devices away from the learning centre through their own service provider enabled them to complete their tertiary study requirements. The next quote indicates the angst students experienced and the help it is to have mobile devices:

> The internet system here ... it drives me crazy. … Sometimes I can't go to different sites. I need to ask, send away, ask [the Teacher Coordinator] to get me permission to view things like YouTube clips that I need for my lectures – I've [been] given certain things I need to view [yet] I've got to get permission. And also when I'm just searching things on Google, if I'm at home, I can just easily click on all kinds of different sites, but with this … it's been very frustrating – enough for me not to come in here at times. So I just get more done at home as far as my research and things. (Participant 19, 61–80)

8.2.6.2 Implications

Institutions could establish direct internet connectivity at learning centres that bypasses the local education department internet system that could be accessed only by staff and students of the ITE program. This is likely to incur an initial infrastructure cost and take some time to install at various sites. An alternative approach is to issue students with pre-paid dongles so they avoid using the local Education Department internet system. Given the small number of students enrolled in community-based ITE programs, this could be quickly implemented with minimal initial cost and then the cost of ongoing top ups. This matter is linked to the issue of the cost to students of mobile network services, which is addressed in Recommendation 10.

8.2.7 Recommendation 7: Ensure operating system neutrality

8.2.7.1 Rationale:

ITE providers must ensure that whatever resources it presents to its students are accessible and fully functional across all operating systems. One person was not able to access web-conferences when using an iPad. This occurred at a time when she had relocated due to domestic violence, and inability to use the iPad contributed to her withdrawing from study.

> Now that was *really* hard for me because, my sister had a[n] iPad and I took it with me, 'cause I was like "Oh yeah, I can still do everything because of the way the course is delivered, is you know, online." So I was like "Oh yeah, I can still do everything – I can go, you know with JCU: Blackboard, Collaborate." But then every time I tried to jump on to a Collaborate session it wouldn't let me. And I'm like "What's wrong?!" and I'm always ringing, like messaging my lecturer. I couldn't get on – "technical difficulties". … I end up finding out that their technology in the uni wasn't up to date for them to deliver it on the iPad. But now this semester they've updated it all. So I can go on Collaborate on my phone. … Because they did that one thing, and upgraded their technology for devices, it's like amazing! If that had of been the case last semester, I probably would have followed through [with study and not withdrawn] [emphasis in original]. (Participant 7, 242–275)

The same person noted that at that time she was unable to use official Word software on an iPad.

> We all have to use the desktop at one stage or another, and then making it, we can do it on the mobile device. For example Word – I tried downloading another Word app, but I don't think it's official Microsoft Office apps or something? I don't think it's up to their level. … Like the iPad is a real essential (Participant 7, 1093–1139).

This recommendation accords with those of Farley et al. (2015, pp. 8-9):

> In order to accommodate learning across a range of devices in a variety of contexts, course materials should be provided in a number of common file formats. … In order for the learning management system (LMS) or a course website to be usable on a mobile device, it needs to be optimised for these devices.

8.2.7.2 Implications:

Software and apps used by the institution must be compatible with all operating systems, fully functional and display properly on mobile devices, and any upgrades must be supplied free to students. Institutions will need to reformat some existing material and design new material so it displays properly for both computers and mobile devices. This will take time to implement and may require additional ICT personnel, so there would be salary costs. This is likely to be a whole-of-institution long-term strategy, and costs would not be borne only by the ITE departments.

8.2.8 Recommendation 8: Supply mobile devices for subjects in which their use is compulsory

8.2.8.1 Rationale

Two people described fellow students who almost failed the course because the institution did not supply an iPad for a compulsory topic about iPads. One stated: "There's only two [iPads]. I've seen how all the … students struggled to do their, complete their module – only two iPads and they all had to use those iPads" (Participant 7, 1316-1321). Another participant commented:

> She didn't – for that whole iPad module (that was done in the last week of her course … because there was actually two of them [students]) – didn't have an iPad; [the institution] didn't send them one. That whole module … they nearly didn't pass their whole [qualification] because they did not have the correct resources to complete that unit. (Participant 25, 358–361)

8.2.8.2 Implications

If an institution includes a compulsory topic in which a specific mobile device is required, then the institution must supply sufficient numbers of that mobile device to students. This could be directly to off-site students, and by providing a set to every learning centre (the size of the set could be determined by the number of students at that site, with a ratio of, say, one mobile device to two students and students would share). There would be an initial purchase expense for such items. Administrative procedures would need to be established for loaning the mobile devices. Furthermore, the time to complete assignments must be generous, to enable students at learning centres to share the mobile devices. As indicated in Recommendation 1, there will need to be constant evaluation of trends in online learning and use of mobile devices, and it is likely that topics and the devices used in them will change every three years or so. The expense for such turnover could be built into recurrent funding projections.

8.2.9 Recommendation 9: Establish policies regarding the supply of mobile devices to students

8.2.9.1 Rationale

In the current research, neither of the institutions offering community-based ITE had a policy to integrate mobile devices into study. By default, this led to a situation of Bring Your Own Device (BYOD). BYOD is a significant global trend in universities as indicated in the following quote:

> The BYOD movement is enabling students to learn using the technology with which they are already familiar and comfortable, providing them with a greater sense of ownership over their learning. … today's students expect to be able to use whatever devices they choose to access learning content, take notes, gather data, and communicate frequently with their peers and instructors. In this sense, the adoption of BYOD does not revolve around promoting technology use, but facilitating ubiquitous learning and productivity gains (L. Johnson et al., 2016, p. 36).

A significant question facing higher education institutions is whether they support students using a BYOD approach or whether they require students to use a limited number of preferred models of mobile devices. Fitting with the latter scenario, a few years ago the Australian Government funded a laptop to every senior secondary school pupil (Buchanan, 2011). That program stopped, but many schools offer schemes to enable pupils to have laptops or tablets. A number of higher education

institutions are issuing mobile devices to tertiary students (Cross, 2010; Dalziel, 2013; G. D. Murphy, 2011). In 2013, Western Sydney University began issuing tablets to all first-year undergraduates and teaching staff. Apart from tablets, students reported using other mobile devices, including smartphones and laptops for specialised uses (Russell, in press). Participants in my PhD research noted they are being trained as professional school teachers who are required to demonstrate competency to teach school children how to use current technologies, including mobile devices. They pointed out it is incongruous to provide mobile devices to school pupils but not to pre-service teachers.

Among the 64 participants, there were 26 who commented on the supply of mobile devices. Of these 26, 23 (or 88%) mentioned the institution issuing, hiring or loaning mobile devices. It was suggested that use of mobile devices would enhance completion rates. One person proposed that current students could write a letter advocating their use.

> [Our letter would be] so people can see that "Oh … these people are using the technology in the mobile devices and they're flying through with flying colours; and you've got people who are just lagging behind, a few, a little bit, because they have to wait till Monday. They can't do it on the weekend. They have to wait till Monday. You know, too bad they're sick, then they stay home again. They don't come in and they lose a whole lot of work because they don't have [a mobile device]. … If something like that could have been subsidised for students then you'd have all these students getting it [a mobile device] and jumping on board and not failing and not wasting government's money and time on dropouts or you know on their courses. [They would not have people] saying "Nah, don't want to do it anymore, 'cause it's too hard, don't have any time, and I keep failing my assessments" (Participant 13, 1025–1049).

8.2.9.2 Implications

The Evaluation Panel for MATSITI suggested that all pre-service teachers have tablets (P. Johnson et al., 2016, p. 110). Providers of community-based ITE programs need to establish policies about issuing, hiring or loaning mobile devices. They must determine whether they will fully fund or partly subsidise the cost to students of purchasing mobile devices, and whether they will support funding for this purpose from other sources. These are major issues affecting an institution; they require intensive investigation – including seeking students' opinions – and extensive preparation (Russell & Jing, 2013; Russell, Malfroy, Gosper, & McKenzie, 2014). The costs of large-scale disbursement of free mobile devices are significant, and so too are costs associated with improving wifi services and internet access (Russell, in press).

8.2.10 Recommendation 10: Subsidise the cost of mobile network services to students

8.2.10.1 Rationale

As indicated above, in the current research neither of the institutions offering community-based ITE had a policy to integrate mobile devices into study, nor did they have a policy about the cost of mobile network services to students using their own mobile devices. By default, this led to a situation in which the student paid. Of the 64 participants, 18 (or 28%) made comments about the cost of mobile network services. Two stated that their usual pre-paid allocation quickly runs out, as watching recommended You Tube clips and attending web-conferencing sessions rapidly deplete credit. Another person remarked that students can't afford to pay for their internet usage, and another said that it was a financial burden for most students.

> It could become financially challenging for them to have to expect to pay additional money on top of their fees, on top of text books and whatever else is laid out in their course to have to pay all their internet connection for a course they are already paying for. (Participant 25, 447–450)

Of the 18 who made comments, eight (or 44%) suggested pre-service teachers be given some kind of assistance with the cost of mobile network services. One idea was for someone else to pay for example, the institution, the government, or a specific government funding program for Aboriginal and Torres Strait Islander students. Another idea was for grants, allowances or subsidies to be given to students:

> Well maybe TAFE could set up something that we could access that on our mobile, the tablets, that maybe they could put towards us so we could access for free! They could pay for it. … Yeah I reckon they should have that support where they could give us tablets or wireless things [dongles] that we could use, from TAFE. (Participant 32, 479–497)

The most recent Australian Regional Telecommunications Review noted the impact of data charges and data volume for remote consumers and proposed four measures to avoid inequalities and enhance affordability: reasonably comparable pricing between metropolitan and non-metropolitan areas; exempting selective content from download quotas (e.g. gov.au or edu.gov sites); support for those on low incomes (e.g. the current telephone allowance and disability groups); and targeted Indigenous requirements (Regional Telecommunications Independent Review Committee, 2015, p. 51).

In December 2015, the Australian Government (Department of Communications and the Arts, 2016) announced:

> Children studying in regional and remote Australia will soon have access to dedicated broadband capacity – outside of their home broadband quota – and faster download speeds on the nbn 'Sky Muster' satellite. … nbn intends to propose a 50GB data allowance per student per month to a maximum of three students per location.

However, this is not available for tertiary students, as reported by the Australian Communications Consumer Action Network (2016): "*Is this available for other education services, such as university?* No, educational services will only be available to distance education school children" [emphasis in original]. This means that Aboriginal and Torres Strait Islander pre-service teachers in very remote communities are excluded from this free 50GB data allowance, and thus they are forced to continue to pay high costs for internet access on their mobile devices.

Recent data from a survey of rural, regional and remote users indicated high costs for mobile broadband; this included set-up costs and monthly data costs. Most people in the survey (74%) had to purchase an antenna to access mobile broadband; some people bought additional equipment:

> In terms of the *cost for extra equipment* purchased to gain access to mobile broadband, 45% of respondents paid between $0 and $500 for their antenna, 29% paid between $501 and $1000 and 21% paid between $1000 and $2000 for their extra equipment. Around 4% paid more than $2001, with a range between $2400 and $6000 paid for extra equipment to access the internet. [emphasis in original] (Better Internet for Rural, Regional and Remote Australia, 2016, p. 18).

Regarding monthly data costs, the survey results stated: "Respondents of the survey *pay up to $20.00 per gigabyte* (GB) and receive between 1GB and 120GB of mobile broadband data per month" [emphasis in original] (Better Internet for Rural, Regional and Remote Australia, 2016, p. 19). The survey results showed that with respect to mobile phone coverage, "*72% purchased extra equipment* – with the majority (46%) paying between *$1000 and $2000* to access the mobile phone service" [emphasis in original] (Better Internet for Rural, Regional and Remote Australia, 2016, p. 36).

In June 2016, the Broadband for the Bush Alliance (2016, p. 2) issued a statement which lamented the fact that "data allowances, peak to off-peak data split and the relative cost of retail plans highlighted the inequity that still remains for those in the bush".

8.2.10.2 Implications

A major question facing higher education institutions is whether assistance is offered towards the costs of mobile network services. This is likely to become more pressing as ITE providers make their courses available to students in locations where there

are no learning centres. This is a matter of social justice and human rights. If a course is only offered through online mode, and there are no learning centres close to the students' homes and no fixed-line services to the students' residences, then the only possible way to do the course is through mobile network services. Yet these services generally cost more than fixed-line services and are often more expensive for remote locations. I advocate that higher education providers (1) lobby the national government to extend the 50GB data allowance per student per month to regional and remote tertiary students, and for this to be included in the 2017 May budget, and (2) provide students in community-based ITE programs with pre-paid mobile broadband with monthly top-ups, commencing in Semester 1 2017, until Point 1 is implemented.

8.3 Suggestions for further research

Areas of potential future research are presented. The first raises global prospects. The rest are confined to the two community-based ITE programs and their successors. Again, this is done to maintain concentrated attention to the central concern of the research. However, well-designed rigorous research in these areas is likely to be of benefit globally to other contexts of marginalised Indigenous communities in remote locations accessing tertiary education through mobile devices. There may also be possibilities for research in these contexts for other areas such as health, governance, justice and industry. I leave it to those who have expertise in such matters to consider and conduct ongoing research.

8.3.1 Alignment of cultural philosophies and mobile learning

New understandings about the uptake of mobile devices due to congruence between mobile learning and cultural philosophies were identified based on this research. Further investigation is warranted among a range of people groups to explore the ways in which cosmology, ontology, epistemology and axiology affect the adoption of technology.

8.3.2 Research within RATEP

An opportunity exists to conduct detailed research over a number of years about the impact of use of mobile devices within community-based ITE provided by RATEP. A range of metrics could be included, such as timing of completion of assignments and grades of assignments within one topic, timing of completion of topics and grades of topics within a semester or year, and timing of completion of course and grade of course.

8.3.3 The off-site group within RATEP

Since 2012, RATEP has enrolled off-site students in locations where there is no learning centre. The approach has developed in recent years and has received support from MATSITI. A report by TAFE Queensland North for RATEP (2015, p. 7) drew attention to “the low attrition numbers, ‘completion on time’ rate, and growth and sustainability of the offsite model”. There is an opportunity to conduct ongoing research over coming years with the off-site cohort about metrics similar to those mentioned in 8.3.2.

8.3.4 Pre-tertiary and tertiary programs after AnTEP

As indicated in 2.2.6, AnTEP has ceased to operate, and a pre-tertiary program commenced in 2016. This and any subsequent programs will soon operate under different conditions from AnTEP, as mobile coverage will be present for all the major communities by mid-2018. Funding was announced in mid-2015 for five communities in the APY Lands (Department of Communications and the Arts, 2015). Now is an opportune time to set up longitudinal research for the pre-tertiary program which could track the impact of the use of mobile devices on study. Similarly, long term research on the use of mobile devices should be embedded into the design of any new tertiary program. Limitations of data from AnTEP included lack of completion rates as defined by the national regulatory body (Tertiary Education Quality Standards Agency, 2012), and lack of information about graduates’ careers after completing the course. These are of particular interest in view of the problem which prompted the research: low completion rates and the lack of parity of Aboriginal and Torres Strait Islander teachers and leaders in the schooling workforce.

8.3.5 Aboriginal and Torres Strait Islander tertiary students and andragogy

The major finding for Research Question 2 related to the andragogic aspect of being self-directed in learning with regard to time and space. Other andragogic elements were exhibited in the emergent themes detailed in section 6.2.2. Further investigation of the confluence of andragogic characteristics and use of mobile devices by Aboriginal and Torres Strait Islander people in very remote communities may have ongoing positive impacts on the design, provision and conduct of a range of learning scenarios in these contexts.

8.4 Personal reflections

Doing doctoral study gave me the privilege of renewing friendships with Anangu in

the APY Lands as well as making new friends there, and with Aboriginal and Torres Strait Islander people across Queensland. I am grateful to them and to other Aboriginal and Torres Strait Islander people across Australia who have given me their time or whose writings I have read which have helped me to understand more of their cultural philosophies. I recognise I am still learning.

This time also gave me the gift of examining my orientation as a researcher and my stance as a person. This meant continuing reflection, to look at my life over the years and to consider where I now stand and the path I would like to take. I have sought to articulate aspects of that in the Jarwon – Malpa – Paraclete orientation. I appreciate the generosity of those who have invited me to “come alongside” and welcomed me.

As I finish the thesis I do not know what lies ahead. I trust that there will be opportunities to continue some of the friendships which have been established, and that I will honour the trust which has been given to me. I look forward to more times of travelling together and sitting alongside.

8.5 Concluding statement

This research explored the perceptions and practices of Australian Aboriginal and Torres Strait Islander pre-service teachers about integrating mobile devices within two community-based ITE programs. Four research questions were addressed. The findings filled a gap in the literature by presenting a comparison of data between two community-based ITE programs. The majority of participants used mobile devices for educational purposes: accessing content, handling administration, sharing personal encouragement and collaborating for academic support. They indicated that use of mobile devices provided pragmatic benefits to their complex lives and facilitated their ability, as adults, to be self-directed in their learning with regard to place and time of study. There was a strong desire to use mobile devices for educational purposes, by both current and prospective tertiary students. Participants thought study without mobile devices was difficult and believed that use of mobile devices can increase the speed at which they finish work, thereby boosting retention and completion. Participants pointed to alignments between aspects of mobile learning and elements of cultural philosophies.

New knowledge was created by the construction of a Grounded Theory of enhancing professional learning through use of mobile devices for Aboriginal and Torres Strait Islander pre-service teachers. An original contribution to the field was the explication of the adoption of mobile devices due to the alignment of aspects of

mobile learning with elements of cultural philosophies. A novel researcher orientation was articulated which highlighted parallels between Aboriginal processes of friend-making and an ancient Greek term to position the researcher as “one who comes alongside”.

This research is specific to the two community-based ITE programs and experiences of the participants. There were a number of limitations to the research, yet it was appropriate to offer recommendations for ITE providers. Suggestions were made for future research, as this research raises issues relevant to global tertiary study by Indigenous peoples in remote locations.

After travelling with and sitting alongside the research participants I sought to carefully and faithfully express their voice on the various issues which have arisen, as well as present my own interpretation of what I experienced. It has also been an opportunity to consider what might yet be, how Aboriginal and Torres Strait Islander people and non-Indigenous people can travel together and sit alongside one another and how mobile devices may similarly be lifelong companions.

9 APPENDICES

9.1 Appendix A: Stakeholder engagement

Date	Stakeholder	Location
1 Feb 2012	Pitjantjatjara classes, weekly in 2012	Adelaide
3 April 2012	CRC-REP Remote Education Systems project team member	Alice Springs
4-5 April 2012	National Alliance of Remote Indigenous Schools, Let's get oriented conference	Alice Springs
4-5 April 2012	Director of Northern Indigenous Schools Support Unit, Qld DETE	Alice Springs
7 April 2012	CRC-REP Remote Education Systems project team member	Alice Springs
11 April 2012	Coordinator AnTEP, UniSA	Adelaide
29-30 April 2012	Learning at Hand conference	Cairns
1 May 2012	Coordinator RATEP, TAFE Queensland North	Cairns
1 May 2012	Coordinator RATEP, Far North Indigenous Schools Support Unit, Qld DETE	Cairns
3 May 2012	RATEP leadership team	Cairns
6 May 2012	Ex superintendent of Ernabella Mission, Presbyterian Church of Australia	Adelaide
11 May 2012	Project Manager, Ara Irititja Project	Adelaide
21-26 May 2012	Field trip to APY Lands	Yulara + APY Lands
21 May 2012	Principal, Nyangatjatjara College	Yulara
22 May 2012	Pitjantjatjara Yankunytjatjara Education Committee (PYEC)	Umuwa
22 May 2012	Ninti One, Aboriginal Community Researcher	Umuwa
22 May 2012	Anangu Coordinator, Amata Anangu School	Umuwa
22 May 2012	Principal Wiltja, SA DECD	Umuwa
22 May 2012	Coordinating Principal Aboriginal Lands District Schools, SA DECD + other Principals	Umuwa
22 May 2012	Director, Anangu Education Services, SA DECD	Umuwa
22 May 2012	Coordinator AnTEP, UniSA	Pukutja
22 May 2012	Coordinator AnTEP, APY Lands	Pukutja

25 May 2012	CRC-REP Remote Education Systems Research Hub meeting	Yulara
29-31 May 2012	CRC-REP Induction	Alice Springs
1-4 July 2012	Australian Teacher Education Association conference, "Going for gold - Reshaping teacher education for the future"	Adelaide
9-11 July 2012	More Aboriginal and Torres Strait Islander Teachers Initiative conference, "Teachers are deadly"	Adelaide
26 July 2012	Webinar by Broadband for the Bush	virtual
14 Nov 2012	FU + CRC-REP, "Points of Connection" - research discovery forum	Adelaide
24 Jan 2013	Coordinator AnTEP, UniSA	Adelaide
3 April 2013	Chair FU Social and Behavioural Research Ethics Committee	Adelaide
12 April 2013	FU School of Education Proposal presentation	Adelaide
17-23 June 2013	Field trip to Ngannyatjarra Lands WA and APY Lands SA	Ng Lands + APY Lands
24-26 June 2013	National Alliance of Remote Indigenous Schools, Leaders' conference	Alice Springs
July 2013	Aboriginal Lands District conference, DECD	Alice Springs
July 2013	Indigenous Remote Communications Association	Alice Springs
July 2013	Growing Our Own teacher education program	Alice Springs
17-18 July 2013	Australian Council for Computers in Education, SA State conference	Adelaide
6 Aug 2013	Assistant Professor in Information Systems, University of Canberra	Canberra
7 Aug 2013	CRC-REP Annual Student Forum	Canberra
8 Aug 2013	Ninti One Research Presentation Day + 10th anniversary	Canberra
18-24 Aug 2013	field visit to Anangu Pitjantjatjara Yankunytjatjara Lands	APY Lands
27 Aug 2013	Pro Vice Chancellor Information Services, Flinders University	Adelaide
29 Aug 2013	UniSA Graduation ceremony	Adelaide
2 Sept 2013	Dean, School of Education	Adelaide
10-18 Sept 2013	field visit to Anangu Pitjantjatjara Yankunytjatjara Lands	APY Lands

17 Sept 2013	Coordinator RATEP, Far North Indigenous Schools Support Unit, Qld DETE & Teacher Coordinators	teleconference
18 Sept 2013	Sidney Myer Rural Lecture 3 - Red Dirt Curriculum: Reimagining Remote Education	Alice Springs
26 Sept 2013	CRC-REP RES, Thinking Outside The Tank: Can technology save remote education from the tyranny of distance?	teleconference
14-15 Oct 2013	More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI) National Forum: A Deadly Career!	Adelaide
4-25 Nov 2013	field visit to Queensland	Queensland
4 Nov 2013	TAFE North Queensland RATEP team, Ian Hodges, Mark Linkson,	Cairns
5 Nov 2013	Coordinator RATEP, Far North Indigenous Schools Support Unit, Qld DETE	Cairns
13 Nov 2013	RATEP leaders, James Cook University	Townsville
14 Nov 2013	Project Manager, Indigenous Strategic Product Development at Metro North Hospital and Health Service	Queensland
22 Nov 2013	Mobile Learning Evaluation Framework by University of Southern Queensland	Queensland
1-5 Dec 2013	Australian Association for Research in Education conference	Adelaide
11 Dec 2013	Pro Vice Chancellor Information Services, Flinders University	Adelaide
20 Jan 2014	Yunggorendi First Nations Centre for Higher Education and Research	Adelaide
5 June 2014	Broadband for the Bush Alliance	teleconference
25 June 2014	Digital Rural Futures conference	Toowoomba
25-26 June 2014	Professor of Mobile Learning, University of Wolverhampton	Toowoomba
25-26 June 2014	Batchelor Institute of Indigenous Tertiary Education	Toowoomba
30 June 2014	Higher Education Research Group Adelaide	Adelaide
7 July 2014	Sidney Myer Rural Lecture 4 - Vibrant Rural Communities: Leading the Way for Sustainable Futures	Adelaide
11 Aug 2014	Dean Indigenous Strategy and Engagement, FU, Indigenous Nation Building forum	Adelaide

18 Aug 2014	Director Research and Evaluation, DECD	Adelaide
27 Aug 2014	CRC-REP Roundtable	Adelaide
8 Sept 2014	Ex superintendent of Ernabella Mission, Presbyterian Church of Australia	Adelaide
22-24 Sept 2014	Ninti One + CRC-REP annual students' forum	Alice Springs
24 Sept 2014	Yunggorendi First Nations Centre for Higher Education and Research	Adelaide airport
30 Sept. - 3 Oct. 2014	Australian Computers in Education Conference, "Now its personal"	Adelaide airport
9 Oct 2014	Broadband for the Bush Alliance	teleconference
21 Oct 2014	Dianne Brown, AnTEP graduate	Adelaide
13 Nov 2014	Law professor, The University of Toronto, "Stolen Generations: Lessons from the Canadian Experience"	Adelaide
20 Nov 2014	Associate Professor in the area of ICT in Education University of Technology	Sydney
20 Nov 2014	Damian Maher, University of Technology	Sydney
20 Nov 2014	Laurel Dyson, University of Technology & + Hardy Ernst, University of Queensland	Sydney
20-22 Nov 2014	anz ML group	Sydney
16 March 2015	George Otero, Relational Leadership,	Adelaide
9 April 2015	Coordinator AnTEP, APY Lands	Adelaide
14 April 2015	Coordinator AnTEP, APY Lands	Adelaide
22 April 2015	Work Honestly In Progress conference, FU, Humanities and Creative Arts, Law, History and Education postgraduate students	Adelaide
30 April 2015	CRC-REP Remote Education Systems project team member & two other PhD candidates	Adelaide
30 April 2015	Coordinator AnTEP, UniSA	Adelaide
20 May 2015	CRC-REP Remote Education System evaluation	teleconference
24 June 2015	CRC-REP Remote Education Systems, Lecture Series #3, Complexity and Chaos in Remote Schools	Adelaide

2 July 2015	anzmobilelearning group	teleconference
8-9 July 2015	Relational Leadership and Learning, International Dialogue	workshop participant
15 July 2015	Broadband for the Bush Forum IV	virtual
17-21 Aug 2015	CRC-REP Annual Student Forum	Alice Springs
21 Sept 2015	Indigenous Content in Education Symposium	Adelaide
29-30 Sept 2015	National Indigenous Research and Knowledges Network	Adelaide
30 Sept.-1 Oct. 2015	More Aboriginal and Torres Strait Islander Teachers Initiative #OurMobTeach Conference	Adelaide
27 Nov 2015	CRC-REP Remote Education Systems lecture series, Adelaide	Adelaide
3 Dec 2015	Mobile devices in rural education: Global and Indonesian contexts	Adelaide
9 Feb 2016	CRC-REP Remote Education Systems - A Red Dirt Journey: Celebrating Remote Education Research	Adelaide

9.2 Appendix B: Call-for-participants poster

Have you got a mobile phone?

Can you use laptops, netbooks, tablets, or iPads?

Philip Townsend is doing research about using mobile devices for study by Aboriginal and Torres Strait Islander trainee teachers in remote communities.

Philip has worked in remote places for most of his life,
including the Anangu Pitjantjatjara Yankunytjatjara Lands and Papua New Guinea.

He would like volunteers to participate and help by sharing their ideas.

Who can join?

If you are an AIEW (Aboriginal or Islander Education Worker) working in a school, or if you are an AIEW studying towards a degree to become a registered teacher.

What do I have to do?

You can answer some questions by yourself and / or be in a group that discusses ideas.

studying to be a teacher
mobile devices
ways of learning
and Aboriginal and Torres Strait Islander people's views of life.

You can suggest ideas for the group to discuss.
You can answer a written questionnaire.

When will Philip come?

Philip will come in 2013 (Terms 3 or 4) and in 2014 (Terms 1 or 2).

Look at

http://mtu.flinders.edu.au/events/3MT2012-Phil_Townsend.cfm

to see Philip talking about his research

Email: philip.townsend@flinders.edu.au
Telephone: 08 8201 5670 Mobile: 0468 931 370

Mail: Mr P. Townsend, School of Education, Flinders University, GPO Box 2100, Adelaide, SA 5001.

This research is supported by the Cooperative Research Centre for Remote Economic Participation (CRC-REP).
It has been approved by Flinders University, UniSA and James Cook University.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (#6052). For more information regarding ethical approval of the project the Secretary of the Committee can be contacted by telephone on 8201 5962, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

9.3 Appendix C: Letter of introduction

School of Education
Faculty of Education, Humanities & Law
Flinders University
GPO Box 2100
Adelaide SA 5001

Tel +61 08 8201 5638
Fax +61 08 8201 3184
john.halsey@flinders.edu.au

www.flinders.edu.au/education/rural

CRICOS Provider No. 00114A

LETTER OF INTRODUCTION

Dear ……

This letter is to introduce Philip Townsend who is a doctoral student in the School of Education at Flinders University. He will produce his student card, which carries a photograph, as proof of identity.

He is undertaking research leading to the production of a thesis or other publications on the subject of "Travelling together and sitting alongside", which will explore how the use of mobile technologies for tertiary study by Aboriginal and Torres Strait Islander school educators in remote communities might affect their professional learning. He is interested to get ideas from Aboriginal and Islander Education Workers (AIEWs) who are studying to get a teaching qualification.

Philip would like a few people to form a local reference group who can give advice and suggest the right way to do the research. These groups could include people such as the community-based training program coordinators, graduates from the program, Aboriginal and Torres Strait Islander teachers, and community members of the school governing council.

As the main part of his research he would be grateful if some AIEWs would volunteer to talk with him, either in a one-on-one interview or as part of a focus group (discussion group). Individual interviews could go for 30 minutes, and focus groups might last one hour. He would like to talk with you two times over the next two years. Interviews will take place in the trainee teachers' room at the school in your community.

Remote communities have small populations and only a few people work as Aboriginal and Islander Education Workers (AIEWs) in schools. This means it will be almost impossible to guarantee that other people will not know you were helping Philip. You will have to decide if that is a worry for you. He knows that within Aboriginal and Torres Strait Islander culture only certain people have the right to speak on some issues because of their authority as custodians of knowledge, and that it is important for others to know the names of these people. In respect for this cultural view, if you ask that your name be used, then it will be included. If you don't want your real name used Philip can use a pretend one (a pseudonym). If you tell Philip information but ask that it not be used in his publications, then he will keep what you say confidential and not put it in anything he writes.

You do not have to answer every question. You can stop helping Philip at any time you choose. Philip will send you a transcript of the individual interview so you can check he has got your words accurately. If he includes your comments in what he writes, he will send that part of his writing to you so you can check he has understood your meaning properly, and is using your words in a good way. All notes and/or recordings from interviews will be securely stored on a computer with password protection, to which only Philip has access, so far as the law allows.

Before you start doing anything with him, Philip will ask you to sign a form to say you give your consent for him to record the interview, to use the recording or a transcription in preparing the thesis, report or other publications. After a couple of years when he is writing things and wants to use your words, he will check that you still give your consent for him to do that.

You can say whether or not you want him to use your name, and whether or not Philip can let other researchers use the recording and use your name. It may be necessary to make the recording available to secretarial assistants to translate and / or type. These people will be told whether or not you want others to know your name or what you said.

Philip might ask to take photographs of you which he could use in his writing or when he gives presentations about this research. The photos would demonstrate ways mobile devices could be used in tertiary study. Photos will be taken in a manner that will not show your face. He will give you a consent form to sign.

After Philip has got comments from various people he will come up with ideas about how things fit together. About a year later he will send out a written questionnaire based on his ideas and ask different people to give answers to help work out if his ideas make sense.

Any enquiries you may have concerning this project should be directed to me at the address given above or by telephone (08 8201 5638), fax (08 8201 3184) or e-mail (john.halsey@flinders.edu.au).

Thank you for your attention and assistance.

Yours sincerely

Professor John Halsey FACE
Sidney Myer Chair of Rural Education and Communities
School of Education
Flinders University

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (#6052). For more information regarding ethical approval of the project the Secretary of the Committee can be contacted by telephone on 8201 5962, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

9.4 Appendix D: Information sheet

School of Education
Faculty of Education, Humanities & Law
Flinders University
GPO Box 2100
Adelaide SA 5001

Tel +61 08 8201 5638
Fax +61 08 8201 3184
john.halsey@flinders.edu.au

www.flinders.edu.au/education/rural

CRICOS Provider No. 00114A

13 August 2013

INFORMATION SHEET

Title: Travelling together and sitting alongside

Investigator:
Mr Philip Townsend
School of Education
Flinders University
Telephone: 08 8201 5670

Description of the study:
This study is part of the project entitled '*Travelling together and sitting alongside*'. This project will investigate the possible effect on completion rates for tertiary study of the use of mobile technologies by Aboriginal and Torres Strait Islander trainee teachers in remote communities. This project is supported by Flinders University School of Education.

Purpose of the study:
This project aims to find out

- ways Aboriginal and Islander Education Workers (AIEWs) in remote communities think the use of mobile technologies could affect their rate of progress towards completion of a teaching qualification;
- ways teaching and learning methods for adults are affected by the use of mobile technologies in the delivery of teacher training to AIEWs in remote communities;
- ways features of mobile learning fit with Aboriginal and Torres Strait Islander views about knowledge, the universe, how people exist and the values that are important to people;
- the parts of content material, administrative support, and personal encouragement for their teacher training that AIEWs in remote communities want to see provided by mobile technologies.

inspiring achievement

What will I be asked to do?
You are invited to attend either a one-on-one interview or be part of a group discussion and have your photograph taken doing these or using a mobile device. Photos will be taken in a manner that will not show your face, unless you say that is alright. These photographs might be used in presentations and writing by Philip Townsend. He will give you a consent form to sign.

He will ask questions about the possible use of mobile devices in teacher training. Individual interviews could go for 30 minutes, and focus groups might last one hour. These will be recorded using a digital voice recorder. After that it will be typed-up, translated (if you used your own language), and stored as a computer file. Interviews and group discussions will take place in the trainee teachers' room at the school in your community. After Philip has got comments from various people he will come up with ideas about how things fit together. About a year later he will send out a written questionnaire based on his ideas and ask different people to give answers to help work out if his ideas make sense. People can put these in a stamped, sealable, addressed envelope and post back to Philip or hand to him if he is in their community.

Are there any risks or discomforts if I am involved?
Philip does not think there are any physical risks or other problems if you help with interviews, group discussions or questionnaires. Philip will set up a Reference Group of Aboriginal and Torres Strait Islander people who will give advice to him about good ways to do the research, and will comment on the way the project is going and make suggestions for changes. If you are worried about anything, please talk with Philip and the Reference Group or Philip's university.

How will I receive feedback?
Philip will send you a transcript of the interview so you can check he has got your words accurately. If he includes your comments in what he writes, he will send that part of his writing to you so you can check he has understood your meaning properly, and is using your words in a good way. You will help Philip keep to his monthly timetable by sending your comments to him within 28 days. You can tell him not to include your words or ideas in his writing.

Within two months of a visit to a community Philip will send you an information sheet about his visit. In July and December for the next few years he will send out a research update of the whole project. At the same time Philip will send you a short video about what he's been doing for the last six months.

All notes and/or recordings from interviews will be securely stored on a computer with password protection, to which only Philip has access, so far as the law allows. Philip will use the information to write about the project in a thesis for his university (this is like a book) and he might also write articles for journals. The universities that give community-based teacher training will get copies of these things. The local Aboriginal and Torres Strait Islander education group will also get copies. After the project is finished, the university will keep the information for seven years.

Will I be identifiable by being involved in this study?
Remote communities have small populations and only a few people work as Aboriginal and Islander Education Workers (AIEWs) in schools. This probably means most people in your community will know you are helping Philip. You will have to think if that might be a worry for you. Within Aboriginal and Torres Strait Islander culture only certain people have the right to speak on some issues because of their authority as custodians of knowledge, and it is important for others to know the names of these people. In respect for this cultural view, if you ask that your name be used, then it will be included. If you don't want your real name used Philip can use a pretend one (a pseudonym).
If you tell Philip information but ask that it not be used in his publications, then he will keep what you say confidential and not put it in anything he writes.
Philip is a registered teacher in South Australia. This means that if he knows about illegal activities he has to report it, and he cannot stop authorities searching his information.

Who is giving money to make this research project happen?
The Cooperative Research Centre for Remote Economic Participation (CRC-REP) will provide $17,500.00 over three and a half years for the project. Most of this money will be spent on Philip's travel (plane flights, car hire, accommodation, food, etc.) – to attend CRC-REP meetings and to visit remote communities in South Australia and Queensland. Participants will not be paid. People involved with interviews and discussion groups will have light refreshments (e.g. tea / coffee and biscuits).

What benefit will I gain from being involved in this study?
You and other AIEWs will have had the opportunity to …

- think, talk and discuss ideas about teacher training with yourself, other AIEWs and interested people;
- evaluate your personal priority of gaining a teaching qualification;
- consider barriers and facilitators to completing teacher training qualifications;
- become aware of national and international trends regarding use of mobile technologies, particularly relating to higher education and teacher training;
- identify ways in which the use of mobile technologies could improve learning and teaching in your course;
- explore ways cultural views and features of mobile learning match together;
- examine course elements such as content material, administrative support and personal encouragement;
- present ideas through the researcher's publications to training institutions, the academic community, government entities and business groups.

What might be benefits to AIEWs if mobile devices are used in their courses?
You and other AIEWs might …

- Develop skills to use mobile devices for professional study;
- Connect to the online material and get in touch with other students and course tutors when travelling away from your home community;
- Keep going with study and not drop subjects or quit the course;
- Finish subjects and the whole course faster;
- Get good ideas from other students, and be able to help them;
- Become good examples about using mobile devices for educational purposes.

What might be long term benefits from this research?

- Universities might agree to use mobile technologies for teacher training of AIEWs in remote communities;
- Universities might have better ways of teaching and learning for adult AIEWs in remote communities by using mobile devices;
- There might be increased numbers of registered Aboriginal and Torres Strait Islander teachers;
- The quick turnover of non-Aboriginal and Torres Strait Islander teachers in remote community schools might drop because there are more registered Aboriginal and Torres Strait Islander teachers;
- The school outcomes of pupils in remote communities might improve due to less disruption because of greater stability of staff and the cultural understanding of Aboriginal and Torres Strait Islander classroom teachers;
- There might be more opportunities for Aboriginal and Torres Strait Islander people to do courses at universities and get access to higher education;
- There might be a contribution to national discussions on changes by in the design of teacher qualifications, teacher registration, and professional standards for teachers;
- There might be an impact on policy regarding funding and infrastructure in the communications industry - regarding the roll out of the NBN, mobile coverage, and satellite services.

How do I agree to participate?
Having an interview or joining in a group discussion is voluntary. You do not have to answer every question. You can stop helping Philip at any time you choose. There will be no problems with Philip, your school or your university if you stop. There is a consent form you will need to fill in and sign if you want to participate. You can give this to Philip when he comes to your community. If you decide to fill in a questionnaire that will show you have given your consent.

Thank you for taking the time to read this information sheet and we hope that you will accept our invitation to be involved.

Any enquiries you may have concerning this project should be directed to me at the address given above or by telephone (08 8201 5638), fax (08 8201 3184) or e-mail (john.halsey@flinders.edu.au).

Yours sincerely,

Professor John Halsey FACE
Sidney Myer Chair of Rural Education and Communities
School of Education, Flinders University

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (#6052). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

9.5 Appendix E: Consent forms for interviews

School of Education
Faculty of Education, Humanities & Law
Flinders University
GPO Box 2100
Adelaide SA 5001

Tel +61 08 8201 5638
Fax +61 08 8201 3184
john.halsey@flinders.edu.au

www.flinders.edu.au/education/rural

CRICOS Provider No. 00114A

CONSENT FORM FOR PARTICIPATION IN RESEARCH

(by interview or focus group)

Travelling together and sitting alongside

I …….

am an adult over the age of 18 years and I agree and give my consent to participate as requested in the Information Sheet for the research project on how the use of mobile technologies for tertiary study by Aboriginal and Torres Strait Islander school educators in remote communities might enhance their professional learning.

1. I have read the information provided.
2. I am satisfied I understand the explanation given to me about procedures and risks.
3. I agree to audio recording of my information and participation.
4. I am aware that I should keep a copy of the Information Sheet and Consent Form for future reference.
5. I understand that:

- I may not directly benefit from taking part in this research.
- I am free to withdraw from the project at any time and am free to decline to answer particular questions.
- Other people will probably know that I have been involved. I can choose to have my name or the name of my community in the published work(s) or I can choose to use pretend names (pseudonyms).
- Whether I participate or not, or withdraw after participating, will have no effect on any treatment or service that is being provided to me.
- Whether I participate or not, or withdraw after participating, will have no effect on my progress in my course of study, or results gained.
- I may ask that the recording/observation be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.

Participant's signature……Date……...

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher's name: **Philip Bruce Townsend**

Researcher's signature……Date……..

NB: Two signed copies should be obtained. The copy retained by the researcher may then be used for authorisation of Items 6 and 7, as appropriate.

\\userST\T\town0006\MyWork\& PhD\& Ethics\FU\Final application\Consent Form, Interview or focus group, P.B. Townsend, 2013-04-08.doc
Updated 28 June 2006

6. I, the participant whose signature appears below, have read a transcript of my participation and agree to its use by the researcher as explained.

Participant's signature……..Date……...

7. I, the participant whose signature appears below, have read the researcher's report and agree to the publication of my information as reported.

Participant's signature……..Date……...

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (6052). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

9.6 Appendix F: List of interview questions

Individual and Focus group interviews

Travelling together and sitting alongside: How might the use of mobile technologies enhance the professional learning of Aboriginal and Torres Strait Islander school educators in remote communities?

1 In what ways have you seen people using mobile technologies for educational purposes?

2 How do you think these could be used for your Initial Teacher Education (ITE) study?

3 Why would you like to use mobile devices for your ITE study?

4 How do you think the university might change the way it delivers your ITE training if you used mobile devices?

5 How could the teaching and learning in your ITE course be improved through using mobile devices?

6 What some areas of your ITE study you would like to see delivered by mobile devices?

[Prompts: Content material, administrative support, or personal encouragement]

7 How do you think having these things by mobile devices would help you finish things more quickly?

8 What are the ways you think that mobile learning is different from the ways you have been using so far for your ITE study?

9 What do you think are the special cultural ways Aboriginal and Torres Strait Islander people look at life?

[Prompts ~ views of

(1) the universe – physical and spiritual realities; (2) identity / being; (3) knowledge; (4) values]

10 Can you describe ways that using mobile devices match these Aboriginal and Torres Strait Islander views of life?

11 How would using mobile devices for your ITE study be different from what you are doing now?

12 How could using mobile devices speed up the way you finish units or the whole ITE course, so you get a qualification and become a registered teacher?

13 What needs to happen so you could use mobile devices in your ITE study?

9.7 Appendix G: Consent form for photographs

School of Education
Faculty of Education, Humanities & Law
Flinders University
GPO Box 2100
Adelaide SA 5001

Tel +61 08 8201 5638
Fax +61 08 8201 3184
john.halsey@flinders.edu.au

www.flinders.edu.au/education/rural

CRICOS Provider No. 00114A

PARTICIPANT PHOTOGRAPH RELEASE FORM

Travelling together and sitting alongside

I .....

agree to the photographs taken of me for the research study ***'Travelling together and sitting alongside'*** (as requested in the Participant Information Sheet) to be used for: [please circle whichever applies]

researcher's background analysis only / not for display	agree/don't agree
display in thesis materials	agree/don't agree
display in academic articles and presentations	agree/don't agree

1. I have read the information provided in the Participant Information Sheet.
2. I am satisfied I understand the explanation given to me about procedures and risks.
3. I am aware that I should retain a copy of the Information Sheet and Participant Photograph Release Form for future reference.
4. I understand that unless I request to be identified:
   - All photographs will be de-identified using computer editing software;
   - Photographs will be numbered not labelled to maintain anonymity.

Participant's signature..... **Date**.....

I certify that I have explained how photographs will be used to the volunteer and consider that she / he understands what is involved and freely consents to participation.

Researcher's name: PHILIP TOWNSEND

Researcher's signature..... **Date**.....

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project number 6052).For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

9.8 Appendix H: Survey

Mobile Devices for Remote Study

What is this survey about?
The survey has two parts. ***Part A*** asks questions about you. This will help me understand the backgrounds of people who answer.
Part B asks about the ways you use mobile devices. This will help me to see the most common ways people use mobile devices, especially for educational reasons.

What happens if I don't do it? There is no problem if you don't want to do it; it is not compulsory. It won't affect your teacher training course. It won't change any of your marks or your subject grades. If you are working in a school, it will not change your pay.

Why should I do it? If you volunteer and do the survey, it will help me get ideas to write about for the research. When people at universities and TAFEs read those ideas, it might help them think about good ways to use mobile devices in their courses for people who live in communities. That might mean in future years study is more interesting and easier.

What is the research project? - This survey is part of my PhD research for a thesis with the title "Travelling together and sitting alongside: How might the use of mobile technologies enhance the professional learning of Aboriginal and Torres Strait Islander school educators in remote communities?"
This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (#6052). For more information regarding ethical approval of the project the Secretary of the Committee can be contacted by telephone on 08 8201 5962, by fax on 08 8201 2035 or by email human.researchethics@flinders.edu.au

What group is behind the research?
I've been given a scholarship from the Cooperative Research Centre for Remote Economic Participation (CRC-REP) through Ninti One, and I am a member of the Remote Education Systems team.

What is Philip's background?
I was a teacher at a bilingual school in the Anangu Pitjantjatjara Yankunytjatjara Lands in South Australia (1984-1986). Then I went to Papua New Guinea for 23 years (1987-2009), and worked with a church in bilingual adult religious education. When I got back to Australia I worked for Indigenous Scripture Support with Bible Society Australia for part of 2010-2011.

*

There are no right or wrong answers for this survey; I am just very interested in what you think. I would like you to do all the questions, but if you want to skip some or just stop and not do any more, that is OK. The survey will probably take you about 15 - 20 minutes to do. I would like to get everyone's answers by 31 March 2015.

Thank you for your help.

Philip Townsend

1

Part A: Background information about you

INSTRUCTIONS: Please write short answers or put a tick (√).

Q1 What is your name? (You don't have to tell me, you can leave this blank.)

.....

Q2 What is the name of your community or the place where you live?

.....

Q3 What is your gender?
- ❍ Male
- ❍ Female

Q4 How old are you? (Make a guess if you are not sure about the exact number.)

.....

Q5 What was your last grade level or year level when you were a child going to school? (Make a guess if you can't remember exactly.)

.....

Q6 Have you got a job working in a school now?
- ❍ Yes
- ❍ No

If No is selected, then skip to Q11 Have you got a job that is not at a school?

Q7 What is the name of that job?
- ❍ Anangu Education Worker
- ❍ Teacher Aide
- ❍ Other .....

Q8 What way are you working in the school now?
- ❍ Part time
- ❍ Full time

Q9 How many years altogether have you been working in schools?

.....

Q10 Have you got a job now that is not at a school?
- ❍ Yes
- ❍ No

If No is selected, then skip to Q14 Are you studying towards becoming a registered teacher?

Q11 What is the name of that job?

.....

Q12 What way are you working in that job?
- ❍ Part time
- ❍ Full time

Q13 Are you studying towards becoming a registered teacher?
- ❍ Yes
- ❍ No

If No is selected, then skip to Q19 Have you got any of these mobile devices?

Q14 Which program are you in?
- ❍ AnTEP
- ❍ RATEP

Q15 What way are you studying?
- ❍ Part-time
- ❍ Full-time

Q16 How long have you been studying to become a registered teacher?

.....

Q17 In your course (AnTEP or RATEP) what level of study are you doing in 2014?
- ❍ RATEP TAFE Certificate III
- ❍ RATEP TAFE Certificate IV
- ❍ RATEP TAFE Diploma
- ❍ RATEP JCU 2
- ❍ RATEP JCU 3
- ❍ RATEP JCU 4
- ❍ AnTEP Stage 1
- ❍ AnTEP Stage 2
- ❍ AnTEP Stage 3

Part B: Ways you use mobile devices

Q18 Have you got any of these mobile devices?

	Yes	No
mobile phone	❍	❍
tablet (e.g. iPad)	❍	❍
laptop	❍	❍

Q19 Have you got any other kinds of mobile devices? Please tell me what they are.

.....

Q20 Is your mobile phone a touch screen smart phone?

❍ Yes
❍ No

Q21 Has your community got mobile phone coverage?

❍ Yes
❍ I'm not sure
❍ No

Q22 Can you ring or SMS on your mobile phone from your own home?

❍ Yes
❍ I'm not sure
❍ No

Q23 Can you connect to the Internet and go online with a mobile device from your own home?

❍ Yes
❍ I'm not sure
❍ No

Q24 In the last year did you use the mobile device for any of these social reasons?

	Yes	No
games	❍	❍
Internet / online banking	❍	❍
online shopping	❍	❍
using maps / getting directions	❍	❍
social media e.g. Facebook, Diva Chat, Twitter	❍	❍

Q25 What other ways in the last year did you use mobile devices for social reasons?

.....

Q26 How often in the last year did you use mobile devices to contact these people in your community about your study or for educational purposes?

	every day	sometimes in a week	sometimes in a month	never	I'm not sure
People in my school office and administration	❍	❍	❍	❍	❍
Other student teachers in my community	❍	❍	❍	❍	❍
My support teacher in my community	❍	❍	❍	❍	❍

Q27 How often in the last year did you use mobile devices to contact these people who do not live in your community about your study or for educational purposes?

	every day	sometimes in a week	sometimes in a month	never	I'm not sure
Other student teachers in other communities	❍	❍	❍	❍	❍
My lecturers at TAFE / university	❍	❍	❍	❍	❍
Office or administration people at TAFE / university	❍	❍	❍	❍	❍

Q28 How often in the last year did you use mobile devices to contact other people for your study or for educational purposes?

	every day	sometimes in a week	sometimes in a month	never	I'm not sure
I ring or get calls and talk with someone about study.	❍	❍	❍	❍	❍
I send or get SMS or texts about study.	❍	❍	❍	❍	❍
I send and get emails about study.	❍	❍	❍	❍	❍
I use social media (Diva Chat,Facebook, Twitter) to send messages about study.	❍	❍	❍	❍	❍

Q29 How often in the last year did you use mobile devices to do your assignments or create projects for your study or for educational purposes?

	every day	sometimes in a week	sometimes in a month	never	I'm not sure
I write assignments and make presentations.	❍	❍	❍	❍	❍
I take photos or videos or record people talking and send them to others or receive them.	❍	❍	❍	❍	❍
I browse websites for research (e.g. use Google to search, or watch YouTube videos).	❍	❍	❍	❍	❍
I upload assignments to send to my lecturer to be marked.	❍	❍	❍	❍	❍

Q30 How often in the last year did you use mobile devices to go to AnTEP's / RATEP's online system for your study or for educational purposes?

	every day	sometimes in a week	sometimes in a month	never	I'm not sure
I go to my TAFE's / university's online system to check the subject outline or assignment dates.	❍	❍	❍	❍	❍
I look up the set readings for my subject.	❍	❍	❍	❍	❍
I listen to podcasts of recorded lectures.	❍	❍	❍	❍	❍
I do online web conferencing e.g. Elluminate or Collaborate.	❍	❍	❍	❍	❍

Q31 In the last year were there any other ways you used mobile devices for your study or educational purposes? Please tell me these ways, and say how often you used them.

.....
.....
.....
.....
.....
.....

Q32 Is there anything else you would like to tell me about using mobile devices for your study?

.....
.....
.....
.....
.....
.....

End of the Survey

Thank you for doing this survey. I hope it helped you think about using mobile devices for your study. If you would like to tell me anything else in more detail or if you would like to ask me questions, you can contact me.

Here is another way you might be able to keep thinking about mobile devices. I would like some people to volunteer to tell me their ideas about how **cultural ways** might fit with using mobile devices for social reasons and for learning or study. These could be ideas or things people do about knowledge, learning & teaching; or values, morals & things that are important; or people's sense of identity; or views about the universe, people, land, & spirits. I would send you some other questions first so you could begin to think about your ideas, then I would arrange a telephone call or a Skype call so we could go through those questions (for about 20 minutes). If you are interested please let me know.

You can watch a short video (3 minutes) of me talking about the research for the first half of 2014.
https://www.dropbox.com/s/sopgibmzkbl8wy9/MVI_1978%20Philip%20Townsend%2C%20Jan-Jun%202014.MOV?dl=0

In a little while I'll make another video about the last six months of 2014.

Thank you for your help.
Ooroo,
Phil

Philip Townsend

Office Telephone 08 8201 5670
Office Email philip.townsend@flinders.edu.au

Office Postal Address
Philip Townsend
School of Education, Flinders University
GPO Box 2100,
Adelaide, SA 5001

10 REFERENCES

Aboelmaged, M., & Gebba, T. R. (2013). Mobile banking adoption: an examination of technology acceptance model and theory of planned behavior. *International Journal of Business Research and Development (IJBRD), 2*(1), 35-50. Retrieved from https://www.sciencetarget.com/Journal/index.php/IJBRD/article/viewFile/263/60

ACIL Allen Consulting. (2014a). *Evaluation of the Aboriginal and Torres Strait Islander Education Action Plan 2010-2014*. Retrieved from http://www.scseec.edu.au/site/DefaultSite/filesystem/documents/ATSI%20documents/ATSI%202010-2014%20Final%20Evaluation%20Report/1Final_Evaluation_ATSIEAP_ACILAllenConsulting.pdf

ACIL Allen Consulting. (2014b). *Evaluation of the Aboriginal and Torres Strait Islander Education Action Plan 2010-2014: Appendices*. Retrieved from http://www.scseec.edu.au/site/DefaultSite/filesystem/documents/ATSI%20documents/ATSI%202010-2014%20Final%20Evaluation%20Report/0Appendices_ATSIEAP_ACILAllenConsulting.pdf

Adams Becker, S., Cummins, M., Davis, A., & Yuhnke, B. (2016). *2016 NMC Technology Outlook for Australian Tertiary Education: A Horizon Project Regional Report*. Retrieved from http://cdn.nmc.org/media/2016-nmc-technology-outlook-au.pdf

Adedoja, G., & Morakinyo, D. A. (2014). Mobile learning platform programme and pre-service teachers' behaviour towards mobile instruction using technology acceptance model. *Journal of Educational Research and Reviews.* Retrieved from http://www.sciencewebpublishing.net/jerr/archive/2014/February/pdf/Gloria%20and%20Daniel.pdf

Aitken, J. K. (2015). *The T & T Clark Companion to the Septuagint*. London: T & T Clark.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. *Journal of Personality and Social Psychology, 27*(1), 41-57. Retrieved from http://www.apa.org/pubs/journals/psp/index.aspx

Allen, L. (2015). Sexual assemblages: mobile phones/young people/school. *Discourse: Studies in the Cultural Politics of Education, 36*(1), 120-132. doi:10.1080/01596306.2013.846901

Ally, M., & Prieto-Blázquez, J. (2014). What is the future of mobile learning in education? *RUSC. Universities And Knowledge Society Journal, 11*(1), 142-151. doi:10.7238/rusc.v11i1.2033

Alrasheedi, M., Capretz, L. F., & Raza, A. (2015). A systematic review of the critical factors for success of mobile learning in higher education (university

students' perspective). *Journal of Educational Computing Research, 52*(2), 257-276. doi:10.1177/0735633115571928
Anangu. (2011). Ara Irititja Project. Retrieved from http://www.irititja.com/sharing_knowledge/glossary.html
AnTEP. (2006). *Annual program report: Diploma in Education (Anangu Education) / Bachelor of Teaching (Anangu Education)*. Retrieved from
AnTEP. (2007). *Program evaluation report for the Anangu Tertiary Education Program (AnTEP)*. Retrieved from
AnTEP. (2011). *Evaluation and re-accreditation report for AnTEP*. Retrieved from
AnTEP. (2013). Graduates from Stages 1-3, at December 2013. Retrieved from http://w3.unisa.edu.au/antep/graduates.htm
Arabena, K. (2008). *Indigenous epistemology and wellbeing: Universe referent citizenship*. Retrieved from http://www.aiatsis.gov.au/research/docs/dp/DP22.pdf
Arbon, V. (2008). *Arlathirnda Ngurkarnda Ityirnda Being-Knowing-Doing: De-Colonising Indigenous Tertiary Education*. Teneriffe: Post Pressed.
Auld, G., Snyder, I., & Henderson, M. (2012). Using mobile phones as placed resources for literacy learning in a remote Indigenous community in Australia. *Language and Education, 26*(4), 279-296. doi:10.1080/09500782.2012.691512
Australian Bureau of Statistics. (2010). Types of telephones used, Aboriginal and Torres Strait Islander households - 2008. Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4704.0Oct+2010?OpenDocument
Australian Bureau of Statistics. (2011). 1270.0.55.005 - Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, July 2011 Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/1270.0.55.005July%202011?OpenDocument
Australian Bureau of Statistics. (2013a, 27 January 2016). 3238.0.55.001 - Estimates of Aboriginal and Torres Strait Islander Australians, June 2011. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/3238.0.55.001
Australian Bureau of Statistics. (2013b). Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, Australia, July 2011. Retrieved from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/A277D01B6AF25F64CA257B03000D7EED/$File/1270055005_july%202011.pdf
Australian Bureau of Statistics. (2013c). Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, Maps, July 2011. Retrieved from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/2B9F179C6CFA2431CA257B03000D7F21/$File/1270055005_2011_remoteness_structure_maps.pdf
Australian Bureau of Statistics. (2013d). Hitting the books: Characteristics of higher education students. Retrieved from http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features20July+2013
Australian Bureau of Statistics. (2014). Schools, Australia, 2013, Cat. no. 4221.0 Aboriginal and Torres Strait Islander Students. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/4221.0Main%20Features100062013?opendocument&tabname=Summary&prodno=4221.0&issue=2013&num=&view=

Australian Bureau of Statistics. (2016). 4512.0 - Corrective Services, Australia, March Quarter 2016. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/4512.0?OpenDocument

Australian Communication and Media Authority. (2008). *Telecommunications in Remote Indigenous Communities 2008*. Retrieved from http://www.acma.gov.au/webwr/_assets/main/lib310210/telecommunications_in_rics_2008.pdf

Australian Communications Consumer Action Network. (2016). Remote and Isolated Communities and Distance Education. Retrieved from http://accan.org.au/broadband/satellite/remote-and-isolated-communities-and-distance-education

Australian Curriculum Assessment and Reporting Authority. (2016). My School. Retrieved from http://www.myschool.edu.au/

Australian Indigenous Health*InfoNet*. (2016a). Mortality. *Overview of Australian Aboriginal and Torres Strait Islander health status.* Retrieved from http://www.healthinfonet.ecu.edu.au/health-facts/overviews/mortality

Australian Indigenous Health*InfoNet*. (2016b). Overview of Aboriginal and Torres Strait Islander health status 2015. Retrieved from http://www.healthinfonet.ecu.edu.au/health-facts/overviews

Bainbridge, R., Whiteside, M., & McCalman, J. (2013). Being, knowing, and doing: A phronetic approach to constructing grounded theory with Aboriginal Australian partners. *Qualitative Health Research, 23*(2), 275-288. doi:10.1177/1049732312467853

Baleghi-Zadeh, S., Ayub, A. F. M., Mahmud, R., & Daud, S. M. (2014). Behavior intention to use of learning management system among Malaysian pre-service teachers: A confirmatory factor analysis. *International Journal of Education and Literacy Studies, 2*(1), 29-39. doi:10.7575/aiac.ijels.v.2n.1p.29

Bannan, B., Cook, J., & Pachler, N. (2015). Reconceptualizing design research in the age of mobile learning. *Interactive Learning Environments*, 1-16. doi:10.1080/10494820.2015.1018911

Baran, E. (2014). A review of research on mobile learning in teacher education. *Educational Technology & Society, 17*(4), 17-32. Retrieved from http://www.ifets.info/journals/17_4/2.pdf

Bartlett, C. (2006a, October). *The human touch: Establishing and facilitating a successful online learning community.* Paper presented at the "IT's up here for thinking" - The Australian Computers in Education Conference 2006, Cairns.

Bartlett, C. (2006b, November). *Investigating flexible delivery strategies that meet the needs of Remote Area Teacher Education Program (RATEP) Diploma of Education (Aboriginal and Torres Strait Islander) students.* Paper presented at the AARE Annual National Conference, Adelaide, South Australia.

Basden, A. (2011). Enabling a Kleinian integration of interpretivist and socio-critical IS research: the contribution of Dooyeweerd's philosophy. *European Journal of Information Systems, 20*(4), 477-489. Retrieved from http://link.springer.com/journal/41303/20/4

Behrendt, L., Larkin, L., Griew, R., & Kelly, P. (2012). *Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people: Final report*. Canberra: Australian Government Retrieved from http://www.innovation.gov.au/TertiaryEducation/HigherEducation/ReviewofIHER/Pages/default.aspx.

Better Internet for Rural, Regional and Remote Australia. (2016). *The regional internet access survey results*. Retrieved from

https://birrraus.files.wordpress.com/2016/05/birrr-report-2016-survey-results-final.pdf
Biddle, N. (2014). The Relationship between Community and Individual Measures of Wellbeing: comparisons by remoteness for Indigenous Australians. *Australian Geographer, 45*(1), 53-69. doi:10.1080/00049182.2014.869296
Biesta, G., & Tedder, M. (2007). Agency and learning in the lifecourse: Towards an ecological perspective. *Studies in the Education of Adults, 39*(2), 132-149. Retrieved from doi:10.1080/02660830.2007.11661545
Bin-Sallik, M. A., & Smibert, N. (1998). Anangu teacher education: An integrated adult education programme. In L. King (Ed.), *Reflecting visions: New perspectives on adult education for Indigenous peoples.* (pp. 89-110). Hamburg: UNESCO Institute for Education. Retrieved from http://files.eric.ed.gov/fulltext/ED420791.pdf#page=90.
Bokova, I. (2013). *Technology, broadband and education: Advancing the education for all agenda*. Retrieved from http://unesdoc.unesco.org/images/0021/002196/219687e.pdf
Boster, F. J., Shaw, A. Z., Carpenter, C. J., & Lindsey, L. L. M. (2014). Simulation of a dynamic theory of reasoned action. *Simulation & Gaming, 45*(6), 699-731. doi:10.1177/1046878114562930
Bradley, D., Noonan, P., Nugent, H., & Scales, B. (2008). *Review of Australian higher education, final report*. Canberra: Commonwealth of Australia Retrieved from http://apo.org.au/node/15776.
Bradley, J., Norman, D., Norman, L., Miller, J., Friday, G., & Yanyuwa families. (2010). *Singing saltwater country - Journey to the songlines of Carpentaria*. Crows Nest: Allan & Unwin.
Brady, F. R., & Dyson, L. E. (2009). *Report to Wujal Wujal Aboriginal Shire Council on mobile technology in the Bloomfield River valley*. Retrieved from http://www-staff.it.uts.edu.au/~laurel/Publications/MobileTechnologyInBloomfieldRiverValley.pdf
Brady, F. R., Dyson, L. E., & Asela, T. (2008, June). *Indigenous adoption of mobile phones and oral culture.* Paper presented at the Sixth international conference on cultural attitudes towards communication and technology, Nimes, France.
Brasche, I., & Harrington, I. (2012). Promoting teacher quality and continuity: Tackling the disadvantages of remote Indigenous schools in the Northern Territory. *Australian Journal of Education, 56*(2), 110-125. Retrieved from http://journals.sagepub.com/toc/aeda/56/2
Brindley, J., Blaschke, L. M., & Walti, C. (2009). Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distributed Learning, 10*(3). doi:10.19173/irrodl.v10i3.675
Broadband Commission for Digital Development. (2015). *The state of broadband 2015: Broadband as a foundation for sustainable development*. Retrieved from http://www.broadbandcommission.org/Documents/reports/bb-annualreport2015.pdf
Broadband for the Bush Alliance. (2013). A mobile NBN needed for remote Australia. Retrieved from http://broadbandforthebush.com.au/wp-content/uploads/2013/11/20131110_B4BA-_A-mobile-NBN-needed-for-remote-Australia-final-version.pdf
Broadband for the Bush Alliance. (2016). *Broadband for the Bush Forum V: Digital journeys, communique*. Retrieved from http://broadbandforthebush.com.au/wp-

content/uploads/2015/12/BroadbandForTheBush_Forum2016_Communique-Published.pdf
Brookfield, S. D. (2012). Critical theory and transformative learning. In E. W. Taylor & P. Cranton (Eds.), *Handbook of transformative learning: Theory, research, and practice.* (pp. 131-146). San Francisco: Jossey Bass. Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1
Brooks, S. (2014, 3 April 2014). Supreme Court dismisses application to ban contents of SA Museum Aboriginal exhibition, Ngintaka songline. *The Advertiser*. Retrieved from http://www.adelaidenow.com.au/news/south-australia/supreme-court-dismisses-application-to-ban-contents-of-sa-museum-aboriginal-exhibition-ngintaka-songline/story-fni6uo1m-1226873706615
Brown, R. E. (1967). The Paraclete in the Fourth Gospel. *New Testament Studies, 13*(2), 113-132. doi:10.1017/S0028688500018221
Brown, T. G. (2003). *Spirit in the writings of John: Johannine pneumatology in social-scientific perspective* (Vol. 253). London: T. & T. Clark International.
Brusse, C., Gardner, K., McAullay, D., & Dowden, M. (2014). Social media and mobile apps for health promotion in Australian Indigenous populations: Scoping review. *Journal of medical Internet research, 16*(12), e280. doi:10.2196/jmir.3614
Buchanan, R. (2011). Paradox, promise and public pedagogy: Implications of the federal government's digital education revolution. *Australian Journal of Teacher Education (Online), 36*(2), 67-78. Retrieved from http://ro.ecu.edu.au/ajte/vol36/iss2/6/
Burden, K., & Kearney, M. (2016). Conceptualising Authentic Mobile Learning. In D. Churchill, J. Lu, T. K. F. Chiu, & B. Fox (Eds.), *Mobile Learning Design: Theories and Application* (pp. 27-42). Singapore: Springer.
Carlson, B. (2013). The "new frontier": Emergent Indigenous identities and social media. In M. Harris, M. Nakata, & B. Carlson (Eds.), *The politics of identity: Emerging indigeneity.* (pp. 147-168). Sydney: University of Technology Sydney E-Press.
Carlson, B. (2016). *The politics of identity: Who counts as Aboriginal today?* Canberra: Aboriginal Studies Press.
Chadderton, C. (2012). Problematising the role of the white researcher in social justice research. *Ethnography and Education, 7*(3), 363-380. doi:10.1080/17457823.2012.717203
Chan, S. (2010). Applications of andragogy in multi-disciplined teaching and learning. *Journal of Adult Education, 39*(2), 25-35. Retrieved from http://search.proquest.com/docview/871911642?accountid=10910
Charaniya, N. K. (2012). Cultural-spiritual perspective of transformative learning. In E. W. Taylor & P. Cranton (Eds.), *Handbook of transformative learning: Theory, research, and practice.* (pp. 231-244). San Francisco: Jossey Bass. Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1
Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook ofqualitative research* (2nd ed., pp. 509-535). Thousand Oaks: SAGE.
Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks: SAGE.
Charmaz, K. (2012). The power and potential of grounded theory. *Medical Sociology Online, 6*(3), 2-15. Retrieved from http://www.medicalsociologyonline.org/resources/Vol6Iss3/MSo-600x_The-

Power-and-Potential-Grounded-Theory_Charmaz.pdf
Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). London: SAGE.
Charmaz, K. (2015). Teaching theory construction with initial grounded theory tools: A reflection on lessons and learning. *Qualitative Health Research, 25*(12), 1610-1622. doi:10.1177/1049732315613982
Cheng, M. M. H., Tang, S. Y. F., & Cheng, A. Y. N. (2014). Differences in pedagogical understanding among student–teachers in a four-year initial teacher education programme. *Teachers and Teaching, 20*(2), 152-169. doi:10.1080/13540602.2013.848566
Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education, 59*(3), 1054-1064. doi:10.1016/j.compedu.2012.04.015
Chilisa, B. (2012). *Indigenous research methodologies*. Thousand Oaks: SAGE.
Christians, C. G. (2005). Ethics and politics in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (3rd ed., pp. 139-164). Thousand Oaks: SAGE.
Christie, M. J., Guyula, Y., Gotha, K., & Gurruwiwi, D. (2010). The ethics of teaching from country. *Australian Aboriginal Studies, 2*(Fall 2010), 69-80. Retrieved from http://search.informit.com.au/fullText;dn=767045875963420;res=IELIND
Christie, M. J., Guyula, Y., Gurruwiwi, D., & Greatorex, J. (2013). Teaching from Country: Connecting remote Indigenous knowledge authorities with university students around the world. In L. Ormond-Parker, A. Corn, C. Fforde, K. Obata, & S. O'Sullivan (Eds.), *Information Technology and Indigenous Communities.* (pp. 127-138). Canberra: AIATSIS Research Publications. Retrieved from http://resources.ethnosproject.org/making-the-connection-essays-on-indigenous-digital-excellence/.
Christie, M. J., & Verran, H. (2013). Digital lives in postcolonial Aboriginal Australia. *Journal of Material Culture, 18*(3), 299-317. doi:10.1177/1359183513492081
Chuprina, L., & Durr, R. (2006). Self-directed learning readiness as a predictor of cultural adaptability in expatriate managers. *International Journal of Self-Directed Learning, 3*(1), 13-23. Retrieved from http://www.sdlglobal.com/IJSDL/IJSDL3.1-2006.pdf
Churchill, D., Fox, B., & King, M. (2016). Framework for Designing Mobile Learning Environments. In D. Churchill, J. Lu, T. K. F. Chiu, & B. Fox (Eds.), *Mobile Learning Design: Theories and Application.* In R. H. Kinshuk, M. Jemni, N.-S. Chen, & J. M. Spector (Series Eds.), Lecture Notes in Educational Technology (pp. 3-25). Singapore: Springer. Retrieved from http://link.springer.com/book/10.1007/978-981-10-0027-0/page/1. doi:10.1007/978-981-10-0027-0
Churchill, D., Lu, J., & Chiu, T. K. (2014). Integrating mobile technologies, social media and learning design. *Educational Media International, 51*(3), 163-165. doi:10.1080/09523987.2014.969895
Churchill, D., Lu, J., Chiu, T. K. F., & Fox, B. (2016). *Mobile learning design: Theories and application*. Singapore: Springer.
Ciampa, K. (2014). Learning in a mobile age: An investigation of student motivation. *Journal of Computer Assisted Learning, 30*(1), 82-96. doi:10.1111/jcal.12036
Cilliers, L. (2016). Wiki acceptance by university students to improve collaboration in higher education. *Innovations in Education and Teaching International*, 1-9. doi:10.1080/14703297.2016.1180255

Cochrane, T., & Narayan, V. (2016). Mobile social media: Redefining professional development and collaborative scholarship. In D. Churchill, J. Lu, T. K. F. Chiu, & B. Fox (Eds.), *Mobile Learning Design: Theories and application* (pp. 43-61). Singapore: Springer.

Corbett, J., Singleton, G., & Muir, K. (2009). Web 2.0 for Aboriginal cultural survival: A new Australian outback movement. *Participatory Learning and Action, 59*(1), 71-78. Retrieved from http://www.venus.inet-tr.org.tr/14563IIED.pdf#page=73

Crawford, K. (1986). Bicultural teacher training in mathematics education for Aboriginal trainees from traditional communities. *The South Pacific Journal of Teacher Education, 14*(1), 44-55.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks: SAGE.

Crompton, H., Burke, D., Gregory, K. H., & Gräbe, C. (2016). The use of mobile learning in science: A systematic review. *Journal of Science Education and Technology*, 1-12. doi:10.1007/s10956-015-9597-x

Cross, K. (2010, September 11). iPad replaces uni textbooks at University of Adelaide science faculty. *The Advertiser*. Retrieved from http://www.adelaidenow.com.au/technology/ipad-replaces-uni-textbooks-at-university-of-adelaide-science-faculty/story-fn5jhv6y-1225918213032

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Los Angeles: SAGE.

Cui, Y., & Wang, L. (2012, May). *Motivations for accessing social networking services on mobile devices.* Paper presented at the Proceedings of the International Working Conference on Advanced Visual Interfaces, Capri Island.

Dahlstrom, E., Brooks, D. C., Grajek, S., & Reeves, J. (2015). *ECAR Study of Students and Information Technology, 2015*. Retrieved from http://net.educause.edu/ir/library/pdf/ss15/ers1510ss.pdf

Dalziel, B. (2013, October). *A multidimensional approach to adopting iPads in medical education.* Paper presented at the 2013 IEEE 63rd annual conference, International Council for Educational Media, Singapore.

Danaher, P. A., & Umar, A. (Eds.). (2010). *Perspectives on distance education: Teacher education through open and distance Learning*. Vancouver: Commonwealth of Learning.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly, 13*(3), 319-340. Retrieved from http://misq.org/misq/downloads/?___store=library

Department for Education and Child Development. (2013). *Aboriginal Strategy 2013-2016.* Adelaide: Government of South Australia Retrieved from https://www.decd.sa.gov.au/sites/g/files/net691/f/decd_aboriginal_strategy_2013-2016.pdf.

Department for Employment, Education and Training. (1989). *National Aboriginal and Torres Strait Islander education policy*. Canberra: Commonwealth of Australia Retrieved from https://docs.education.gov.au/node/36633.

Department of Broadband, Communications and the Digital Economy. (2009). *Australia's digital economy: Future directions, final report*. Canberra: Commonwealth of Australia Retrieved from http://www.dbcde.gov.au/__data/assets/pdf_file/0006/117681/DIGITAL_ECONONOMY_FUTURE_DIRECTIONS_FINAL_REPORT.pdf.

Department of Communications and the Arts. (2015). Mobile black spot programme - funded base stations. Retrieved from https://data.gov.au/dataset/mobile-

black-spot-programme-funded-base-stations
Department of Communications and the Arts. (2016). Distance education will receive a broadband boost [Press release]. Retrieved from http://www.minister.communications.gov.au/mitch_fifield/news/distance_education_will_receive_a_broadband_boost#.V4OHsE1f271
Department of Education and Training. (2014). *Completion rates of domestic Bachelor students: A cohort analysis*. Canberra: Commonwealth of Australia Retrieved from https://education.gov.au/selected-higher-education-statistics-time-series-data-and-publications.
Department of Education and Training. (2015). *Teacher Establishment counted for Queensland NARIS Schools 2012- 2015*. Brisbane: Queensland Government
Department of Education and Training. (2016). Ratep - Community based Aboriginal and Torres Strait Islander teacher education program. Retrieved from http://indigenous.education.qld.gov.au/community/ratep/Pages/default.aspx
Doane, A. N., Pearson, M. R., & Kelley, M. L. (2014). Predictors of cyberbullying perpetration among college students: An application of the theory of reasoned action. *Computers in human behavior, 36*, 154-162. doi:10.1016/j.chb.2014.03.051
Dockery, A. M. (2014). A wellbeing approach to mobility and its application to Aboriginal and Torres Strait Islander Australians. *Social Indicators Research, 125*(1), 243-255 doi:10.1007/s11205-014-0839-8
Donovan, M. (2007). Can information communication techological tools be used to suit Aboriginal learning pedagogies? In L. E. Dyson, M. Hendriks, & S. Grant (Eds.), *Information technology and Indigenous people* (pp. 93-104). Hershey: Idea Group.
Dudgeon, P., Calma, T., & Holland, C. (2016). What works in Aboriginal and Torres Strait Islander suicide prevention? *InPsych: The Bulletin of the Australian Psychological Society Ltd, 38*(1), 18-19. Retrieved from http://www.psychology.org.au/inpsych/2016/feb/dudgeon
Dunn, D. J. (2011). *Symphonia in the Secular or How to Be Orthodox When You Lose Your Empire.* Paper presented at the Power and Authority in the Eastern Christian Experience: Papers of the Sophia Institute Academic Conference, New York, December 2010.
Dyson, L. E., & Brady, F. R. (2009, June). *Mobile phone adoption and use in Lockhart River Aboriginal community.* Paper presented at the ICMB 2009. Eighth International Conference on Mobile Business, 2009, Dalian, Liaoning, China.
Dyson, L. E., & Brady, F. R. (2013). A study of mobile technology in a Cape York community: Its reality today and potential for the future. In L. Ormond-Parker, A. Corn, C. Fforde, K. Obata, & S. O'Sullivan (Eds.), *Information Technology and Indigenous Communities* (pp. 9-26). Canberra: AIATSIS Research Publications.
Eady, M. (2010). *Creating optimal literacy learning environments using synchronous technologies to support Aboriginal adult learners effectively: a Narungga perspective.* (PhD), University of Wollongong, Wollongong. Retrieved from http://ro.uow.edu.au/cgi/viewcontent.cgi?filename=0&article=4179&context=theses&type=additional
Education Council. (2015). *National Aboriginal and Torres Strait Islander education strategy 2015*. Carlton South: Council of Australian Governments Retrieved from http://educationcouncil.edu.au/site/DefaultSite/filesystem/documents/ATSI%

20documents/NATSI_EducationStrategy_v3.pdf.
Edwards, D., & McMillan, J. (2015a). *Completing university in a growing sector: Is equity an issue?* Retrieved from http://research.acer.edu.au/cgi/viewcontent.cgi?article=1045&context=higher_education
Edwards, D., & McMillan, J. (2015b). Completing university in Australia: A cohort analysis exploring equity group outcomes. *Joining The Dots: Research Briefing, 3*(3), 1-11. Retrieved from http://research.acer.edu.au/joining_the_dots/29
Edwards, W. H. (2012). *Mission in the Musgraves: Ernabella Mission 1937-73, a place of relationships*. Uniting Church Historical Society (S.A.). Adelaide.
Edwards, W. H., & Underwood, B. D. (2006). Changes in education as hunters and gatherers settle: Pitjantjatjara education in South Australia. In C. Dyer (Ed.), *The education of nomadic peoples: Current issues, future prospects* (pp. 101-119). New York: Berghahn Books.
Ellis, C. (2007). Telling secrets, revealing lives relational ethics in research with intimate others. *Qualitative Inquiry, 13*(1), 3-29. doi:10.1177/1077800406294947
English, L. M., & Irving, C. J. (2012). Women and transformative learning. In E. W. Taylor & P. Cranton (Eds.), *Handbook of transformative learning: Theory, research, and practice.* (pp. 245-259). San Francisco: Jossey Bass. Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1.
Ess, C., & Sudweeks, F. (2005). Culture and Computer-Mediated Communication: Toward New Understandings. *Journal of Computer-Mediated Communication, 11*(1), 179-191. doi:10.1111/j.1083-6101.2006.00009.x
Farley, H., Murphy, A., Johnson, C., Carter, B., Lane, M., Midgley, W., . . . Koronios, A. (2015). How do students use their mobile devices to support learning? A case study from an Australian regional university. *Journal of Interactive Media in Education, 2015*(1), 1-13. doi:10.5334/jime.ar
Farley, H., Murphy, A., Todd, N. A., Lane, M., Hafeez-Baig, A., Midgley, W., & Johnson, C. (2015). Moving towards the effective evaluation of mobile learning initiatives in higher education institutions. In Y. A. Zhang (Ed.), *Handbook of Mobile Teaching and Learning.* (pp. 721-740). Berlin: Springer-Verlag. doi:10.1007/978-3-642-54146-9_17
Featherstone, D. (2011). The Ngaanyatjarra Lands telecommunications project: A quest for broadband in the Western Desert. *Telecommunications Journal of Australia, 61*(1), 4.1-4.25. Retrieved from http://www.irca.net.au/images/stories/documents/186-1072-7-PB.pdf
Featherstone, D. (2013). The Aboriginal invention of broadband: How Yarnangu are using ICTs in the Ngaanyatjarra Lands of Western Australia. In L. Ormond-Parker, A. Corn, C. Fforde, K. Obata, & S. O'Sullivan (Eds.), *Information Technology and Indigenous Communities.* (pp. 27-52). Canberra: AIATSIS Research Publications. Retrieved from http://resources.ethnosproject.org/making-the-connection-essays-on-indigenous-digital-excellence/.
Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*. Reading: Addision–Wesley.
Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again*. Cambridge: Cambridge University Press.
Ford, P. L. (2010). *Aboriginal knowledge, narratives & country: Marri Kunkimba Putj Putj Marrideyan*. Tenneriffe: Post Pressed.

Fortunati, L. (2002). The mobile phone: Towards new categories and social relations. *Information, communication & society, 5*(4), 513-528. doi:10.1080/13691180208538803

Fredericks, B. L. (2010). Reempowering Ourselves: Australian Aboriginal Women. *SIGNS: A Journal of Women in Culture and Society, 35*(3), 546-550.

Fredericks, B. L., Adams, K., Finlay, S. M., Fletcher, G., Andy, S., Briggs, L., . . . Hall, R. (2011). Engaging the practice of Indigenous yarning in action research. *Action Learning and Action Research Journal, 17*(2), 7-19. Retrieved from http://www.alarassociation.org/pages/publications#gsuser_journal

French-Kennedy, A. (1982). *Anangu Teacher Education - a survey of community needs (April - July 1982)*. Adelaide: South Australian College of Advanced Education.

Furler, L., & Scott, C. (1988). Negotiating a new model for Aboriginal teacher education: ANTEP [AnTEP] - A case study. In K. Faith (Ed.), *Towards new horizons for women in distance education: International perspectives* (pp. 229-247). London: Routledge.

Gado, I., Ferguson, R., & van 't Hooft, M. (2006). Using handheld-computers and probeware in a science methods course: Preservice teachers' attitudes and self-efficacy. *Journal of Technology and Teacher Education, 14*(3), 501. Retrieved from http://www.aace.org/pubs/jtate/

Gale, M. (1996). AnTEP comes of age. *The Australian Journal of Indigenous Education, 24*(1), 17-25. Retrieved from https://www.cambridge.org/core/journals/australian-journal-of-indigenous-education

Ganley, L. (2014). Connect, innovate and support: The keys to digital inclusion for Aboriginal and Torres Strait Islander peoples. In G. Booth & J. Huggins (Eds.), *Making connections: Essays on Indigenous digital excellence.* (pp. 11-24). Freemantle: Vivid Publishing. Retrieved from http://resources.ethnosproject.org/making-the-connection-essays-on-indigenous-digital-excellence/.

Garrett, P. (2011). New $5m scheme for teachers in remote communities [Press release]. Retrieved from http://ministers.deewr.gov.au/garrett/new-5m-scheme-teachers-remote-communities

Geia, L. K., Hayes, B., & Usher, K. (2013). Yarning / Aboriginal storytelling: Towards an understanding of an Indigenous perspective and its implications for research practice. *Contemporary Nurse: a Journal for the Australian Nursing Profession, 46*(1), 13-17. Retrieved from http://search.informit.com.au/fullText;dn=211941231696632;res=IELAPA

George, R. (1992, October). *Identification of suitable distance education technologies in the Anangu Teacher Education Program.* Paper presented at the Educational Technology for the Clever Country: Selected papers from EdTech'92, Adelaide.

Giles, W. (2010). Teacher education in a remote community: Learning on the job. *Asia-Pacific Journal of Cooperative Education, 11*(3), 57-66. Retrieved from http://www.apjce.org/files/APJCE_11_3_57_65.pdf

Gilmore, J. H., & Pine, B. J. (1997). The four faces of mass customization. *Harvard business review, 75*, 91-101. Retrieved from http://go.galegroup.com/ps/i.do?&id=GALE|A19129098&v=2.1&u=flinders&it=r&p=EAIM&sw=w&authCount=1

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory; strategies for qualitative research*. Chicago: Aldine Publishing Co.

Godfrey, A., Vos, J., Phillips, T., & Giusti, J. (2014). *Mobile learning policy handbook: An insider's guide to the issues*. Retrieved from http://www.gsma.com/connectedliving/wp-content/uploads/2014/07/mLearning_14_07_14-1.pdf

Goldkuhl, G. (2012). Pragmatism vs interpretivism in qualitative information systems research. *European Journal of Information Systems, 21*(2), 135-146. doi:10.1057/ejis.2011.54

Grayston, K. (1981). The meaning of parakletos. *Journal for the Study of the New Testament, 4*(13), 67-82. doi:10.1177/0142064X8100401305

Grebowicz, M., & Merrick, H. (2013). *Beyond the cyborg: Adventures with Donna Haraway* Retrieved from http://site.ebrary.com/lib/flinders/detail.action?docID=10732923

Growing Our Own. (2012). *Growing Our Own: Indigenous pre-service teacher handbook 2012*. Darwin: Charles Darwin University.

Guba, E., & Lincoln, Y. S. (2005). Paradigmatic controversies, contradictions and emerging confluences. In N. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (3rd ed.). Thousand Oaks: SAGE.

Guenther, J., & McRae-Williams, E. (2011). Making the most of technologies for learning in remote context. *VOCAL: The Australian Journal of Vocational Education and Training in School, 9*, 88-92, 94-95. Retrieved from http://www.voced.edu.au/content/ngv%3A48707

Guglielmino, L. M. (2013). The case for promoting self-directed learning in formal educational institutions. *SA-eDUC, 10*(2), 1-18. Retrieved from http://www-nwu-ac-za.web.nwu.ac.za/sites/www.nwu.ac.za/files/files/p-saeduc/sdl%20issue/Guglielmino,%20L.M.%20The%20case%20for%20promoting%20self-directed%20lear.pdf

Gunawardena, C. N., & Jung, I. (2014). Perspectives on culture and online learning. In I. Jung & C. N. Gunawardena (Eds.), *Culture and online learning: Global perspectives and research* (pp. 1-14). Sterling: Stylus.

Halcomb, E. J., Gholizadeh, L., DiGiacomo, M., Phillips, J., & Davidson, P. M. (2007). Literature review: Considerations in undertaking focus group research with culturally and linguistically diverse groups. *Journal of Clinical Nursing, 16*(6), 1000-1011. doi:10.1111/j.1365-2702.2006.01760.x

Hall, L. (2012). The 'come and go' syndrome of teachers in remote Indigenous schools: Listening to the perspective of Indigenous teachers about what helps teachers to stay and what makes them go. *The Australian Journal of Indigenous Education, 41*(02), 187-195. doi:10.1017/jie.2012.13

Hall, L. (2014a). Developing an ethics of relational responsibility – locating the researcher within the research and allowing connection, encounter and collective concern to shape the intercultural research space. *Ethics and Education, 9*(3), 329-339. doi:10.1080/17449642.2014.946378

Hall, L. (2014b). A model for small, remote, Indigenous communities. In M. Jones & J. Ryan (Eds.), *Successful teacher education: Partnerships, reflective practice and the place of technology.* (pp. 83-99). Rotterdam: Sense. doi:10.1007/978-94-6209-677-6

Hall, L. (2014c). 'With' not 'about' – emerging paradigms for research in a cross-cultural space. *International Journal of Research & Method in Education, 37*(4), 376-389. doi: 10.1080/1743727X.2014.909401

Hall, L., & Maughan, C. (2015). Going where the students are already – reimagining online learning where students and lecturers co-create an interactive teaching and learning space. *The International Journal of Technologies in Learning, 22*(3), 51-61. Retrieved from

http://ijltl.cgpublisher.com/product/pub.262/prod.96
Halliday, L., Payne, L., & Linkson, M. (2015). *The off-site model: Ratep - Qld Indigenous community based teacher education*. Paper presented at the MATSITI 2015 #OurMobTeach Conference, Adelaide. http://matsiti.edu.au/community-based-teacher-education/
Harding, S. (2009). Standpoint theories: Productively controversial. *Hypatia - A Journal of Feminist Philsophy*, *24*(4), 192-200. doi:10.1111/j.1527-2001.2009.01067.x
Hartsuyker, L. (2007). *Top of the class: Report on the inquiry into teacher education*. (0642788952). Canberra: House of Representatives Publishing Unit.
Henderson, L. (1992, January). *The Remote Area Teacher Education Program (RATEP): An interactive multimedia computer application.* Paper presented at the Proceedings of the International Interactive Multimedia Symposium, Perth.
Henderson, L. (1996). Instructional design of interactive multimedia: A cultural critique. *Educational Technology Research and Development, 44*(4), 85-104. Retrieved from http://researchonline.jcu.edu.au/1725/1/1725_Henderson_1996.pdf
Henderson, L., & Coombs, G. (1989). Confronting disadvantage: A demographic study of the first 53 graduates through AITEP. In N. Loos & G. Miller (Eds.), *Succeeding against the odds: The Townsville Aboriginal and Islander Teacher Education Program* (pp. 17-31). Sydney: Allen and Unwin.
Henderson, L., & Putt, I. (1999a). Evaluating audioconferencing as an effective learning tool in cross-cultural contexts. *Open Learning, 14*(1), 25-37. doi:10.1080/0268051990140105
Henderson, L., & Putt, I. (1999b). Theorizing audioconferencing: An eclectic paradigm. *Canadian Journal of Educational Communication, 27*(2), 87-104. Retrieved from http://www.cjlt.ca/index.php/cjlt/article/view/246/186
Herrington, J., Ostashewski, N., Reid, D., & Flintoff, K. (2014). Mobile technologies in teacher education: Preparing pre-service teachers and teacher educators for mobile learning. In M. Jone & J. Ryan (Eds.), *Successful teacher education: Partnerships, reflective practice and the place of technology.* (pp. 137-151). Rotterdam: Sense. Retrieved from http://link.springer.com/chapter/10.1007%2F978-94-6209-677-6_9.
Hing, N., Breen, H., & Gordon, A. (2010). Respecting cultural values: Conducting a gambling survey in an Australian Indigenous community. *Australian and New Zealand journal of public health, 34*(6), 547-553. doi:10.1111/j.1753-6405.2010.00624.x
Hofstede, G. (2001). *Culture's consequences: comparing values, behaviours, institutions and organizations across nations* (2nd ed.). Thousand Oaks: SAGE.
Hofstede, G. H. (1980). *Culture's Consequences: International Differences in Work-Related Values*. Beverly Hills: Sage Publications
Holderhead, S. (2012, 28 March 2012). APY Lands graduates learn to inspire. *The Advertiser*. Retrieved from http://www.adelaidenow.com.au/news/apy-lands-graduates-set-to-inspire/news-story/6dbe917492f175b014e3721ab2b8e778
Hossain, M. M., & Quinn, R. J. (2013). Prospective US mathematics teachers' engagement in hand-held cellular devices and Web 2.0 activities and their perception of using these technologies for teaching-learning purposes. *Scientific Journal of Education Technology, 3*(7), 95-103. Retrieved from http://www.j-et.org/paperInfo.aspx?ID=1029
Huggins, J. (1998). *Sister girl: The writings of Aboriginal activist and historian*

Jackie Huggins. St Lucia: University of Queensland Press.
Huggins, J. (2014). Foreword. In G. Booth & J. Huggins (Eds.), *Making the connection: Essays on Indigenous digital excellence.* (pp. viii-x). Freemantle: Vivid Publishing. Retrieved from http://resources.ethnosproject.org/making-the-connection-essays-on-indigenous-digital-excellence/.
Hughes, P., & Willmot, E. (1982). A thousand Aboriginal teachers by 1990. In J. L. Sherwood (Ed.), *Aboriginal Education: Issues and Innovations* (pp. 45-49). Perth: Creative Research.
Huijser, H., & Bronnimann, J. (2014). Exploring the opportunities of social media to build knowledge in learner-centered Indigenous learning spaces. In S. Feller & I. Yengin (Eds.), *Educating in Dialog: Constructing meaning and building knowledge with dialogic technology* (pp. 97-110). Amsterdam: John Benjamins Publishing Company.
Huijser, H., Ober, R., O'Sullivan, S., McRae-Williams, E., & Elvin, R. (Eds.). (2015). *Finding the common ground: Narratives, provocations and reflections from the 40 year celebration of Batchelor Institute*. Batchelor: Batchelor Press.
Hultman, K., & Lenz Taguchi, H. (2010). Challenging anthropocentric analysis of visual data: A relational materialist methodological approach to educational research. *International Journal of Qualitative Studies in Education, 23*(5), 525-542. doi:10.1080/09518398.2010.500628
Ibrahim, Y. (2015). Instagramming life: Banal imaging and the poetics of the everyday. *Journal of Media Practice*, *16*(1), 42-54. doi:10.1080/14682753.2015.1015800
Imtinan, U., Chang, V., & Issa, T. (2014). Envisioning mobile learning as the future of teaching and learning via technology: A literature review of mobile learning. In T. Issa, P. Isaias, & P. Kommers (Eds.), *Multicultural Awareness and Technology in Higher Education: Global Perspectives* (pp. 324-341). Hershey: Information Science Reference (an imprint of IGI Global).
Järvelä, S., Näykki, P., Laru, J., & Luokkanen, T. (2007). Structuring and regulating collaborative learning in higher education with wireless networks and mobile tools. *Educational Technology & Society*, *10*(4), 71-79. Retrieved from http://www.ifets.info/journals/10_4/8.pdf
Jasman, A. (2016). Quality initial teacher education policy and practice in Australia and England: Past, present and possible futures. In J. C.-K. Lee & C. Day (Eds.), *Quality and change in teacher education: Western and Chinese perspectives.* (Vol. 13, pp. 95-110). Cham: Springer. doi:10.1007/978-3-319-24139-5
Johnson, G. M. (2013). Technology use among Indigenous adolescents in remote regions of Australia. *International Journal of Adolescence and Youth*, 1-14. doi:10.1080/02673843.2013.823553
Johnson, G. M., & Oliver, R. (2013). *Cognition, literacy and mobile technology: A conceptual model of the benefits of smartphones for Aboriginal students in remote communities.* Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.
Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC Horizon Report: 2016 – Higher education edition*. Retrieved from http://cdn.nmc.org/media/2016-nmc-horizon-report-he-EN.pdf
Johnson, L., Adams Becker, S., Cummins, M., Freeman, A., Ifenthaler, D., & Vardaxis, N. (2013). *Technology outlook for Australian tertiary education 2013-2018: An NMC Horizon Project regional analysis*. Retrieved from http://www.nmc.org/publications/2013-technology-outlook-australian-

tertiary-education
Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 Higher education edition*. Retrieved from http://www.nmc.org/pdf/2014-nmc-horizon-report-he-EN.pdf
Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *NMC Horizon Report: 2015 Higher education edition*. Retrieved from https://www.nmc.org/publication/nmc-horizon-report-2015-higher-education-edition/
Johnson, P., Cherednichenko, B., & Rose, M. (2016). *Evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative project, final report, March 2016*. Retrieved from http://matsiti.edu.au/wp-content/uploads/2016/05/MATSITI-2016-Project-Evaluation-Final-Report.pdf
Joint Select Committee on Cyber-Safety. (2013). *Issues Surrounding Cyber-Safety for Indigenous Australians*. Canberra: Commonwealth of Australia Retrieved from http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_committees?url=jscc/indigenous_australians/report.htm.
Jung, I., & Gunawardena, C. N. (2014). Looking ahead. In I. Jung & C. N. Gunawardena (Eds.), *Culture and online learning: Global perspectives and research* (pp. 186-195). Sterling: Stylus.
Kamberelis, G., & Dimitriadis, G. (2011). Focus groups: Contingent, articulations of pedagogy, politics, and inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (4th ed., pp. 545-561). Thousand Oaks: SAGE.
Kearney, M., & Burden, K. (2014). *Investigating distinctive pedagogies in mobile learning*. Paper presented at the Society for Information Technology & Teacher Education International Conference 2014, Jacksonville. http://www.editlib.org/p/131013
Kearney, M., Schuck, S., Burden, K., & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Research in Learning Technology, 20*. doi:10.3402/rlt.v20i0/14406
Kemelfield, G., George, R., & Houley, J. (1994, 6-10 July 1994). *Utiringkunytja: Advanced learning technologies in remote area Aboriginal teacher education.* Paper presented at the Higher Education in Transition: Twentieth Annual National Conference of the Higher Education Research and Development Society of Australasia, Canberra.
Kinnane, S., Wilks, J., Wilson, K., Hughes, T., & Thomas, S. (2014). *'Can't be what you can't see': The transition of Aboriginal and Torres Strait Islander students into higher education, Final Report 2014*. Retrieved from http://www.nd.edu.au/research/olt-aboriginal-and-torres-strait-islander-transition/research-report-and-literature-review
Knowles, M. S. (1973). *The adult learner: A neglected species*. Houston: Gulf Publishing Company.
Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Chicago: Follett.
Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2011). *The adult learner: The definitive classic in adult education and human resource development* (7th ed.). Oxford: Elsevier.
Kral, I. (2009). Oral to literate traditions: Emerging literacies in remote Aboriginal Australia. *TESOL in Context, 19*(2), 34. Retrieved from http://search.informit.com.au/fullText;dn=065738104212950;res=IELHSS

Kral, I. (2010). *Plugged in: Remote Australian Indigenous youth and digital culture*. Retrieved from http://caepr.anu.edu.au/sites/default/files/Publications/WP/WP69_0.pdf

Kral, I. (2011). Youth media as cultural practice: Remote Indigenous youth speaking out loud. *Australian Aboriginal Studies, 1*, 4-16. Retrieved from http://aiatsis.gov.au/publications/australian-aboriginal-studies-journal/past-issues

Kral, I. (2012). *Talk, text and technology: Literacy and social practice in a remote indigenous community*. Bristol: Multilingual Matters.

Kral, I. (2014). Shifting perceptions, shifting identities: Communication technologies and the altered social, cultural and linguistic ecology in a remote indigenous context. *The Australian Journal of Anthropology*, *25*(2), 171-189. doi:10.1111/taja.12087

Kral, I., & Schwab, R. G. (2012). *Learning spaces: Youth, literacy and new media in remote indigenous Australia* Retrieved from http://epress.anu.edu.au/wp-content/uploads/2012/08/whole1.pdf

Kutay, K., & Mundine, K. (2013). Training for inclusion. In L. Ormond-Parker, A. Corn, C. Fforde, K. Obata, & S. O'Sullivan (Eds.), *Information Technology and Indigenous Communities.* (pp. 75-88). Canberra: AIATSIS Research Publications. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.401.2725&rep=rep1&type=pdf#page=39.

Kwaymullina, A. (2008). Introduction: A land of many countries. In S. Morgan, T. Mia, & B. Kwaymullina (Eds.), *Heartsick for country: Stories of love, spirit and creation*. North Fremantle: Fremantle Press

Lea, T., Tootell, N., Wolgemuth, J., Halkon, C., & Douglas, J. (2008). *Excellence or Exit: Ensuring Anangu futures through education*. Retrieved from http://www.papertracker.com.au/pdfs/cdu_report.pdf

Lee, K., & Brett, C. (2015). Dialogic understanding of teachers' online transformative learning: A qualitative case study of teacher discussions in a graduate-level online course. *Teaching and Teacher Education, 46*, 72-83. doi:10.1016/j.tate.2014.11.001

Lee, M. (2003). Andragogy and foreign-born learners. In L. M. Baumgartner, M.-Y. Lee, S. Birden, & D. Flowers (Eds.), *Adult Learning Theory: A Primer* (pp. 11-16). Columbus: Center on Education and Training for Employment.

Leeson, S., Smith, C., & Rynne, J. (2016). Yarning and appreciative inquiry: The use of culturally appropriate and respectful research methods when working with Aboriginal and Torres Strait Islander women in Australian prisons. *Methodological innovations*, *9*, 1-17. doi:10.1177/2059799116630660

Leggatt, S. (2016). Overcoming the barriers of distance: Using mobile technology to facilitate moderation and best practice in initial teacher training. *Journal of Further and Higher Education*, *40*(3), 432-446. doi:10.1080/0309877X.2014.984597

Liamputtong, P. (2011). *Focus group methodology: Principles and practice*. Thousand Oaks: SAGE.

Liu, M., Geurtz, R., Karam, A., Navarrete, C., & Scordino, R. (2013). Research on mobile learning in adult education. In W. Kinuthia & S. Marshall (Eds.), *On the move: Mobile learning for development.* (pp. 1-64). Charlotte: Information Age Publishing. Retrieved from http://www.edb.utexas.edu/liu/files/MobileLearning_RevOfLit_AdultEd_Final_MinLiu.pdf.

Liu, M., Scordino, R., Geurtz, R., Navarrete, C., Ko, Y., & Lim, M. (2014). A look at

research on mobile learning in K–12 education from 2007 to the present. *Journal of research on Technology in Education, 46*(4), 325-372. doi:10.1080/15391523.2014.925681

Lloyd, D. (2016a). From the Chancellery. *News from the University of South Australia, April 2016.* Retrieved from http://w3.unisa.edu.au/unisanews/2016/April/story5.asp

Lloyd, D. (2016b, 21 April 2016). World insight: One size can't fit all for indigenous communities. Retrieved from https://www.timeshighereducation.com/blog/world-insight-one-size-cant-fit-all-indigenous-communities

Lloyd, J. (2014). Violent and tragic events: The nature of domestic violence-related homicide cases in central Australia. *Australian Aboriginal Studies, 1*, 99-110. Retrieved from http://aiatsis.gov.au/publications/australian-aboriginal-studies-journal/past-issues

Lock, G., Budgen, F., Lunay, R., & Oakley, G. (2012). Welcome to the outback: The paradoxes of living and teaching in remote Western Australian schools. *Australian and International Journal of Rural Education, 22*(3), 117-135. Retrieved from http://search.informit.com.au/documentSummary;dn=084614878498362;res=IELHSS

Logan, L., & Sachs, J. (1992). Changing teacher education through technology: A study of the remote area teacher education project. *Journal of Information Technology for Teacher Education, 1*(2), 189-200. doi:10.1080/0962029920010204

Loos, N., & Miller, G. (1989). *Succeeding against the odds: The Townsville Aboriginal and Islander Teacher Education Program*. Sydney: Allen & Unwin.

MacGill, B. (1999). Ernabella Mission School: a critique. *Journal of the Anthropological Society of South Australia, 32*(1), 1648-1655. Retrieved from http://www.anthropologysocietysa.com/home/wp-content/uploads/2013/02/Macgill-1999.pdf

MacGill, B. (2009). *Aboriginal Education Workers in South Australia: Towards Equality of Recognition of Indigenous Ethics of Care Practices.* (PhD), Flinders University. Retrieved from http://flex.flinders.edu.au/file/ab237a19-d078-4ff8-91c6-040ffbc83dc0/1/Thesis-MacGill-2009.pdf

Macquarie Dictionary. (Ed.) (2015). Macmillan Publishers Group Australia.

Maddison, S., & Partridge, E. (2014). Agonism and intersectionality: Indigenous women, violence and feminist collective identity. In L. M. Woehrle (Ed.), *Intersectionality and social change (Research in social movements, conflicts and change)* (pp. 27-52). Bingley: Emerald Group Publishing Limited.

Maher, M. (2013). Making inclusive education happen: The impact of initial teacher education in remote Aboriginal communities. *International Journal of Inclusive Education, 17*(8), 839-853. doi:10.1080/13603116.2011.602532

Marangunić, N., & Granić, A. (2015). Technology acceptance model: a literature review from 1986 to 2013. *Universal Access in the Information Society, 14*(1), 81-95. doi:10.1007/s10209-014-0348-1

Marin, T., Taylor, A. W., Grande, E. D., Avery, J., Tucker, G., & Morey, K. (2015). Culturally appropriate methodology in obtaining a representative sample of South Australian Aboriginal adults for a cross-sectional population health study: Challenges and resolutions. *BMC research notes, 8*(1), 1-10. doi:10.1186/s13104-015-1080-5

Martin, K. (2003). Ways of knowing, being and doing: A theoretical framework and

methods for indigenous and indigenist re-search. *Journal of Australian Studies, 27*(76), 203-214. doi:10.1080/14443050309387838
Martin, K. (2008). *Please knock before you enter: Aboriginal regulation of outsiders and the implications for researchers*. Tenneriffe: Post Pressed.
MATSITI. (2014a). *Aboriginal and Torres Strait Islander teacher workforce analysis*. Retrieved from http://matsiti.edu.au/teacher-workforce-analysis/
MATSITI. (2014b). Expanded flexible learning in teacher education. Retrieved from http://matsiti.edu.au/ratep-off-site/
MATSITI. (2016). Tarndanya declaration. Retrieved from http://matsiti.edu.au/wp-content/uploads/2015/10/MATSITI-OurMobTeach-Declaration-V4.pdf
Mayotte, G. A. (2003). Stepping stones to success: Previously developed career competencies and their benefits to career switchers transitioning to teaching. *Teaching and Teacher Education, 19*(7), 681-695. doi:10.1016/j.tate.2003.03.002
Mbodila, M., Ndebele, C., & Muhandji, K. (2014). The effect of social mMedia on student's engagement and collaboration in higher education: A case study of the use of Facebook at a South African university. *Journal of Communication, 5*(2), 115-125. Retrieved from http://www.krepublishers.com/02-Journals/JC/JC-05-0-000-14-Web/JC-05-2-000-14-Abst-PDF/JC-5-2-115-14-099-Ndebele-C/JC-5-2-115-14-099-Ndebele-C-Tx[4].pdf
McArdle, M.-J. (2016). New regional Indigenous pathway program gets underway. *News from the University of South Australia, March 2016.* Retrieved from http://w3.unisa.edu.au/unisanews/2016/March/story9.asp
McCallum, G. B., Versteegh, L. A., Morris, P. S., McKay, C. C., Jacobsen, N. J., White, A. V., . . . Chang, A. B. (2014). Mobile phones support adherence and retention of indigenous participants in a randomised controlled trial: strategies and lessons learnt. *BMC Public Health, 14*(1), 622. doi:10.1186/1471-2458-14-622
McCaughtry, N., & Dillon, S. (2008). Learning to use PDAs to enhance teaching: The perspectives of preservice physical educators. *Journal of Technology and Teacher Education, 16*(4), 433-459. Retrieved from http://www.aace.org/pubs/jtate/
McGarvie, N. (1991). A preliminary report on the establishment of the Remote Area Teacher Education Program (RATEP) at Aboriginal and Torres Strait Islander sites in North Queensland. *Aboriginal Child at School, 19*(1), 27-31. Retrieved from https://www.cambridge.org/core/journals/australian-journal-of-indigenous-education/all-issues
McKay, K., & Tighe, J. (2014). Talking through the dead: The impact and interplay of lived grief after suicide. *OMEGA-Journal of Death and Dying, 68*(2), 111-121. doi:10.2190/OM.68.2.b
McKenzie, P., Weldon, P., Rowley, G., Murphy, M., & McMillan, J. (2014). *Staff in Australia's schools 2013: Main report on the survey 2014*. Retrieved from https://docs.education.gov.au/node/36279
McNair Ingenuity Research. (2014). Media usage amongst Aboriginal and Torres Strait Islander people. Retrieved from http://mcnair.com.au/wp-content/uploads/Media-Usage-amongst-Aboriginal-and-Torres-Strait-Islander-People-McNai....pdf
Mejiuni, O. (2012). International and community-based transformative learning. In E. W. Taylor & P. Cranton (Eds.), *Handbook of transformative learning: Theory, research, and practice.* (pp. 304-319). San Francisco: Jossey Bass. Retrieved from

http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1
Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Linking theory and practice*. San Francisco: John Wiley & Sons.
Mezirow, J. (1990). *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning*. San Francisco: Jossey-Bass.
Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Franciso: Jossey Bass.
Mi, M., Wu, W., Qiu, M., Zhang, Y., Wu, L., & Li, J. (2016). Use of mobile devices to access resources among health professions atudents: A systematic review. *Medical Reference Services Quarterly, 35*(1), 64-82. doi:10.1080/02763869.2016.1117290
Miller, G. (1989). The teacher-education needs of people living in remote communities of the Torres Strait and Far North Queensland. In N. Loos & G. Miller (Eds.), *Succeeding against the odds: The Townsville Aboriginal and Islander Teacher Education Program* (pp. 217-223). Sydney: Allen & Unwin.
Milner, H. R. (2007). Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen. *Educational researcher, 36*(7), 388-400. doi:10.3102/0013189X07309471
Ministerial Council for Education, Early Childhood Development and Youth Affairs. (2010). *The Aboriginal and Torres Strait Islander education action plan 2010–2014*. Carlton South: Author Retrieved from http://www.mceecdya.edu.au/verve/_resources/a10-0945_ieap_web_version_final2.pdf.
Ministerial Council on Education, Employment, Training and Youth Affairs. (2006). *Australian directions in Indigenous education 2005–2008*. Carlton South: Author Retrieved from http://www.curriculum.edu.au/verve/_resources/Australian_Directions_in_Indigenous_Education_2005-2008.pdf.
Ministerial Council on Education, Employment, Training and Youth Affairs. (2008). *Melbourne declaration on educational goals for young Australians* Carlton South: Author Retrieved from http://www.curriculum.edu.au/verve/_resources/National_Declaration_on_the_Educational_Goals_for_Young_Australians.pdf.
Mishra, S. (Ed.) (2009). *Mobile technologies in open schools*. Vancouver: Commonwealth of Learning.
Mitchell, G., & Linkson, M. (2012). *RATEP - Community Based Teacher Education*. Paper presented at the MATSITI Teachers are deadly! conference, Adelaide. http://matsiti.edu.au/ratep/
Mobile Black Spot Programme. (nd). Mobile black spot programme. Retrieved from https://www.communications.gov.au/what-we-do/phone/mobile-services-and-coverage/mobile-black-spot-programme
Mooney, N. (2015). Introduction to Indigenous Australia. Retrieved from http://australianmuseum.net.au/indigenous-australia-introduction
More Aboriginal and Torres Strait Islander Teachers Initiative submission re Educational opportunities for Aboriginal and Torres Strait Islander students, House Of Representatives, (2016).
Moreton-Robinson, A. (2009). Imagining the good Indigenous citizen: Race war and the pathology of patriarchal white sovereignty. *Cultural Studies Review, 15*(2), 61-79. Retrieved from http://search.proquest.com/docview/635920626/fulltextPDF?accountid=10910

Moreton-Robinson, A. (2011). The white man's burden: Patriarchal white epistemic violence and Aboriginal women's knowledges within the academy. *Australian Feminist Studies, 26*(70), 413-431. doi:10.1080/08164649.2011.621175

Moreton-Robinson, A. (2013). Towards an Australian Indigenous women's standpoint theory: A methodological tool. *Australian Feminist Studies, 28*(78), 331-347. doi:10.1080/08164649.2013.876664

Morsillo, R. (2008). Indigenous culture and communications: Can stakeholders build a better telephone service? *Telecommunications Journal of Australia, 58*(1), 5.1-5.14. Retrieved from http://www.swinburne.edu.au/lib/ir/onlinejournals/tja/tja_vol58_no1_2008.pdf

Murphy, A., Farley, H., Lane, M., Hafeez-Baig, A., & Carter, B. (2014). Mobile learning anytime, anywhere: what are our students doing? *Australasian Journal of Information Systems, 18*(3), 331-345. Retrieved from http://journal.acs.org.au/index.php/ajis/article/view/1098/647

Murphy, G. D. (2011). Post-PC devices: A summary of early iPad technology adoption in tertiary environments. *E-Journal of Business Education & Scholarship of Teaching, 5*(1), 18-32. Retrieved from http://www.ejbest.org/upload/eJBEST_Murphy_2011_1.pdf

Musharbash, Y. (2008). Sorry business is Yapa way: Warlpiri mortuary rituals as embodied practice. In K. Glaskin, M. Tonkinson, Y. Musharbash, & V. Burbank (Eds.), *Mortality, Mourning and Mortuary Practices in Aboriginal Australia.*Anthropology and cultural history in Asia and the Indo-Pacific (pp. 34-56). Farnham: Ashgate.

My School. (2016). Find a school. Retrieved from https://www.myschool.edu.au/

Naismith, L., Lonsdale, P., Vavoula, G. N., & Sharples, M. (2004). *Literature review in mobile technologies and learning* (0954859413). Retrieved from Birmingham: http://www.futurelab.org.uk/sites/default/files/Mobile_Technologies_and_Learning_review.pdf

Nakata, M. (2003). Indigenous knowledge and the cultural interface: Underlying issues at the intersection of knowledge and information systems. In A. Hickling-Hudson, J. Mathews, & A. Woods (Eds.), *Disrupting preconceptions: Postcolonialism and education* (pp. 19-38). Flaxton: Post Pressed.

Nakata, M. (2007). *Disciplining the savages: Savaging the disciplines*. Canberra: Aboriginal Studies Press.

Nakata, M. (2010). The Cultural Interface of Islander and Scientific Knowledge. *Australian Journal of Indigenous Education, 39*(Supplement), 53-57. Retrieved from https://www.cambridge.org/core/journals/australian-journal-of-indigenous-education/all-issues

Nakata, M. (2014). Editorial. *The Australian Journal of Indigenous Education, 43*(2), iii-iv. doi:10.1017/jie.2014.30

National Aboriginal Education Committee. (1979). *Submission to the national inquiry into teacher education*. Retrieved from Canberra:

National Health and Medical Research Council. (2003). *Values and ethics: Guidelines for ethical conduct in Aboriginal and Torres Strait Islander health research*. Canberra: Commonwealth of Australia Retrieved from http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e52.pdf.

National Health and Medical Research Council. (2015). *National statement on ethical conduct in human research (2007) (Updated May 2015)*. Canberra:

National Health and Medical Research Council Retrieved from http://www.nhmrc.gov.au/guidelines-publications/e72.
Navarro, M. G. (2016). A principled standpoint: A reply to Sandra Harding. *Social Epistemology Review and Reply Collective, 5*(8), 17-23. Retrieved from http://philpapers.org/archive/NAVAPS.pdf
Ngcobo, K. M., & Eyono Obono, S. D. (2013). Modeling ICT adoption factors for the preservation of indigenous knowledge. *International Scholarly and Scientific Research & Innovation, 17*(1), 223-228. Retrieved from http://www.waset.org/publications/9085
Nielsen, H. D. (1997). Quality assessment and quality assurance in distance teacher education. *Distance Education, 18*(2), 284-317. doi:10.1080/0158791970180207
Nilson, C. (2016). A journey toward cultural competence: The role of researcher reflexivity in Indigenous research. *Journal of Transcultural Nursing*, 1-9. doi:10.1177/1043659616642825
Nistor, N., Lerche, T., Weinberger, A., Ceobanu, C., & Heymann, O. (2014). Towards the integration of culture into the Unified Theory of Acceptance and Use of Technology. *British Journal of Educational Technology, 45*(1), 36-55. doi:10.1111/j.1467-8535.2012.01383.x
Ntseane, P. G. (2012). Transformative learning theory: A perspective from Africa. In E. W. Taylor & P. Cranton (Eds.), *Handbook of transformative learning: Theory, research, and practice.* (pp. 274-288). San Francisco: Jossey Bass. Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1
Office for Learning and Teaching. (2012). Australian awards for university teaching. Retrieved from http://www.olt.gov.au/system/files/Awards_Ceremony_Booklet_2012_0.pdf
Ong, W. J. (1982). *Orality and literacy: The technologizing of the word*. London: Methuen.
Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376-407. doi:10.3102/0034654311413609
Ormond-Parker, L., Corn, A., Obata, K., & O'Sullivan, S. (Eds.). (2013). *Information technology and indigenous communities*. Canberra: AIATSIS Research Publications.
Ormond-Parker, L., & Sloggett, R. (2012). Local archives and community collecting in the digital age. *Archival Science, 12*(2), 191-212. doi:10.1007/s10502-011-9154-1
Orr, K., & Williamson, A. (1973). *Education in the Torres Strait: Perspectives for development*. Retrieved from Canberra:
Osborne, B. (2003). Around in circles or expanding spirals? A retrospective look at education in Torres Strait, 1964–2003. *Australian Journal of Indigenous Education, 32*, 61-76.
Osborne, S., & Underwood, B. D. (2010). *AnTEP review (Anangu conversations): Community consultations (September – December 2010)*. Retrieved from Mawson Lakes: http://w3.unisa.edu.au/antep/review/AnTEP%20Review-Dec%202010-final-2.pdf
OurWATCh. (2014). *Reporting on family violence in Aboriginal & Torres Strait Islander communities*. Retrieved from Melbourne: https://www.ourwatch.org.au/MediaLibraries/OurWatch/Images/ourwatch_reporting_on_a-ts_family_violence_aa_v1.pdf
Pandey, K. (2015). Expectations from Future Technologies in Higher Education:

Introduction. In Y. A. Zhang (Ed.), *Handbook of Mobile Teaching and Learning.* (pp. 829-834). Berlin: Springer-Verlag.

Paper Tracker. (2009). APY Lands: Review of secondary education and vocational training. Retrieved from http://www.papertracker.com.au/archived/apy-lands-review-of-secondary-education-and-vocational-training/

Patrick-Rolf, M. (1990). Creating a good maths learning environment. *Aboriginal Child at School, 18*(5), 15-33. Retrieved from https://www.cambridge.org/core/journals/australian-journal-of-indigenous-education/all-issues

Patton, W., Hong, A. L., Lampert, J., Burnett, B., & Anderson, J. (2012). *Report into the retention and graduation of Aboriginal and Torres Strait Islander students enrolled in initial teacher education*. Retrieved from http://www.matsiti.edu.au/docs/MATSITI-ACDE-2012-Report.pdf

Penny, H. H. (1976). *The training of Pitjantjatjara Aborigines for greater teaching responsibilities in South Australian tribal Aboriginal schools: Report and recommendation to the Education Department of South Australia (0724331840).* Adelaide: Department of Education.

Phillips, J. H., Wigger, C., Beissbarth, J., McCallum, G. B., Leach, A., & Morris, P. S. (2014). Can mobile phone multimedia messages and text messages improve clinic attendance for Aboriginal children with chronic otitis media? A randomised controlled trial. *Journal of paediatrics and child health, 50*(5), 362-367. doi:10.1111/jpc.12496

Porter, S. E., & Gabriel, A. K. (2013). *Johannine writings and apocalyptic: An annotated bibliography* (Vol. 1). Leiden: Brill.

Priestley, M., Edwards, R., Priestley, A., & Miller, K. (2012). Teacher agency in curriculum making: Agents of change and spaces for manoeuvre. *Curriculum Inquiry, 42*(2), 191-214. doi:10.1111/j.1467-873X.2012.00588.x

Productivity Commission. (2012). *Schools workforce, Research report*. Canberra: Commonwealth of Australia Retrieved from http://www.pc.gov.au/inquiries/completed/education-workforce-schools/report/schools-workforce.pdf.

Radoll, P. J. (2010). *Stone chips to silicon chips: A grounded theory of information and communication technology adoption in Australian Indigenous households— rural, urban and remote.* (PhD), Australian National University, Canberra. Retrieved from https://digitalcollections.anu.edu.au/bitstream/1885/8371/1/02whole_Radoll.pdf

Reaburn, S., Bat, M., & Kilgariff, C. (2015). Looking for a new common ground: A reflection on Batchelor Institute's teacher education training programs for remote Aboriginal education professionals in the Northern Territory. In H. Huijser, R. Ober, S. O'Sullivan, E. mcRae-Williams, & R. Elvin (Eds.), *Finding the common ground: Narratives, provocations and reflections from the 40 year celebration of Batchelor Institute.* (pp. 31-42). Batchelor: Batchelor Press. Retrieved from http://www.batchelor.edu.au/commonground/.

Regional Telecommunications Independent Review Committee. (2008). *Regional Telecommunications Review: Framework for the future*. Retrieved from http://www.dbcde.gov.au/__data/assets/pdf_file/0004/137803/2008_Glasson_Report_RTIRC.pdf

Regional Telecommunications Independent Review Committee. (2012). *2011–12 Regional Telecommunications Review - Regional communications: Empowering digital communities*. Retrieved from

http://www.rtirc.gov.au/files/2012/06/Regional_Communications-Empowering_digital_communities.pdf.

Regional Telecommunications Independent Review Committee. (2015). *Regional Telecommunications Review 2015: Unlocking the potential in regional Australia*. Retrieved from http://www.rtirc.gov.au/wp-content/uploads/sites/2/2015/10/RTIRC-Independent-Committee-Review-2015-FINAL-Low-res-version-for-website.pdf.

Rehm, M., Mulder, R. H., Gijselaers, W., & Segers, M. (2016). The impact of hierarchical positions on the type of communication within online communities of learning. *Computers in human behavior, 58*, 158-170. doi:10.1016/j.chb.2015.12.065

Rennie, E., Crouch, A., Wright, A., & Thomas, J. (2011). *Home internet for remote indigenous communities*. Retrieved from Sydney: http://accan.org.au/files/SWIN-CLC-CATHomeInternet.pdf

Ricoeur, P. (1994). *Oneself as another* (K. Blamey, Trans.). Chicago: University of Chicago Press.

Rigney, L.-I. (2013). Digital inclusion and Aboriginal futures: Three questions. In L. Ormond-Parker, A. Corn, C. Fforde, K. Obata, & S. O'Sullivan (Eds.), *Making the connection: Essays on Indigenous digital excellence.* (pp. 25-34). Fremantle: Vivid Publishing. Retrieved from http://resources.ethnosproject.org/making-the-connection-essays-on-indigenous-digital-excellence/.

Rintoul, S. (2012, May 19). Songline at heart of secret men's business. *The Australian*. Retrieved from http://www.theaustralian.com.au/national-affairs/songline-at-heart-of-secret-mens-business/story-fn59niix-1226360712409

Rix, E. F., Barclay, L., & Wilson, S. (2014). Can a white nurse get it? "Reflexive practice" and the non-Indigenous clinician/researcher working with Aboriginal people. *Rural Remote Health, 4*, 2679. Retrieved from http://www.rrh.org.au/publishedarticles/article_print_2679.pdf

Robertson, B., Demosthenous, C., & Demosthenous, H. (2005). Stories from the Aboriginal women of the yarning circle: When cultures collide. *Hecate, 31*(2), 34.

Rothwell, N. (2014, March 22). Songlines project sparks indigenous culture war. *The Australian*. Retrieved from http://www.theaustralian.com.au/arts/review/songlines-project-sparks-indigenous-culture-war/story-fn9n8gph-1226860453606

Russell, C. (in press). Growing an m-learning ecology: A systemic university-wide strategy. In A. A. Murphy, H. Farley, L. E. Edwards, & H. Jones (Eds.), *Mobile learning in higher education in the Asia Pacific region: Harnessing trends and challenging orthodoxies*.

Russell, C., & Jing, Q. (2013, December). *Evaluating an institutional blended & mobile learning strategy.* Paper presented at the Electric dreams, 30th ascilite conference, Sydney.

Russell, C., Malfroy, J., Gosper, M., & McKenzie, J. (2014). Using research to inform learning technology practice and policy: A qualitative analysis of student perspectives. *Australasian Journal of Educational Technology, 30*(1), 1-15.

Sachs, J., & Logan, L. (1993). Case study: Technology and teacher education – a study of the Remote Area Teacher Education Programme. *Educational and Training Technology, 30*(4), 327-333. doi:10.1080/0954730930300403

Schriever, J. (2013, 29 August 2013). Eight A[n]angu Pitjantjatjara Yankunytjatjara

Lands women graduate as teachers from UniSA. *The Advertiser*. Retrieved from http://www.adelaidenow.com.au/news/south-australia/eight-anangu-pitjantjatjara-yankunytjatjara-lands-women-graduate-as-teachers-from-unisa/story-fni6uo1m-1226707031908

Schuck, S., Aubusson, P., Kearney, M., & Burden, K. (2013). Mobilising teacher education: A study of a professional learning community. *Teacher Development, 17*(1), 1-18. doi:10.1080/13664530.2012.752671

Sharples, M., Adams, A., Ferguson, R., Gaved, M., McAndrew, P., Rienties, B., . . . Whitelock, D. (2014). *Innovating pedagogy 2014: Open University innovation report 3.* Retrieved from http://www.editlib.org/p/149392/

Shelfer, L. (2009). The legal precision of the term 'πάράκλητος'. *Journal for the Study of the New Testament, 32*(2), 131-150.

Shotsberger, P. G. (2002). Mobile wireless technologies for field-based teacher interns and their partnership teachers. *Computers in the Schools, 19*(3-4), 49-65. doi:10.1300/J025v19v03_05

Silverman, D. (2010). *Doing qualitative research: A practical handbook* (3rd ed.). Los Angeles: SAGE.

Singleton, G. A. M. (2013). *Information communication technology and endogenous community-driven development: A remote Australian Aboriginal case study.* (PhD), Curtin University, Perth. Retrieved from http://www.nintione.com.au/resource/SingletonG_PhD_ICTandCommDevt_AboriginalCaseStudy.pdf

Smibert, N. (1998). *Anangu teachers: Taking the road to pedagogical independence – incorporating issues that Anangu teachers find important in their developing roles as educators in Anangu schools*. Faculty of Education. Deakin University. Geelong.

Smith, L. T. (2012). *Decolonizing methodologies: Research and Indigenous peoples* (2nd ed.). London: Zed Books.

Smith, R., & Macindoe, M. (1991). Education and the interactive multimedia technologies: The Remote Area Teacher Education Project (RATEP). *Unicorn, 17*(3), 139-145.

Songlines of the Western Desert Project. (2015). *Songlines Project 2012–2015: Alive with the Dreaming!* Retrieved from http://archanth.anu.edu.au/sites/default/files/Songlines%20Newsletter%202015%20%20c2_0.pdf

Soomro, K. A., Kale, U., & Yousuf Zai, S. (2014). Pre-service teachers' and teacher-educators' experiences and attitudes toward using social networking sites for collaborative learning. *Educational Media International, 51*(4), 278-294. doi:10.1080/09523987.2014.977003

St Pierre, E. A., Jackson, A. Y., & Mazzei, L. A. (2016). New empiricisms and new materialisms: Conditions for new inquiry. *Cultural Studies↔ Critical Methodologies, 16*(2), 99-110. doi:10.1177/1532708616638694

Standing Council on School Education and Early Childhood. (2012). *2011 Annual Report for the Aboriginal and Torres Strait Islander eduction action plan 2010–2014*. Retrieved from http://www.scseec.edu.au/site/DefaultSite/filesystem/documents/ATSI%20documents/2011%20ATSI%20Report%20Folder/ATSI%202011%20Annual%20Report-FinalB.pdf.

Stone, K. (2016). New Indigenous study pathway to help make career dreams reality. Retrieved from http://www.unisa.edu.au/Media-Centre/Releases/New-Indigenous-study-pathway-to-help-make-career-dreams-reality/#.VxHJ6LcrK70

Stoszkowski, J., & Collins, D. (2015). Using shared online blogs to structure and support informal coach learning–part 1: A tool to promote reflection and communities of practice. *Sport, Education and Society*, 1-24. doi:10.1080/13573322.2015.1019447

Studies, T. A. I. o. A. a. T. S. I. (2012). Guidelines for Ethical Research in Australian Indigenous Studies. Rev. 2nd ed. Retrieved from http://aiatsis.gov.au/sites/default/files/docs/research-and-guides/ethics/gerais.pdf

Sundar, S. S., & Marathe, S. S. (2010). Personalization versus customization: The importance of agency, privacy, and power usage. *Human Communication Research, 36*(3), 298-322. doi:10.1111/j.1468-2958.2010.01377.x

Sung, Y.-T., Chang, K.-E., & Liu, T.-C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education, 94*, 252-275. doi:10.1016/j.compedu.2015.11.008

TAFE Queensland North. (2015). MATSITI evaluation project partner interview: RATEP offsite delivery model. Cairns: TAFE Queensland North.

Tams, S. (2013). Moving cultural information systems research toward maturity: A review of definitions of the culture construct. *Information Technology & People, 26*(4), 383-400. doi:10.1108/ITP-11-2012-0138

Tang, S. Y. F. (2003). Challenge and support: The dynamics of student teachers' professional learning in the field experience. *Teaching and Teacher Education, 19*(5), 483-498. doi:10.1016/S0742-051X(03)00047-7

Tangentyere Council, & Central Land Council. (2007). *Ingerrekenhe antirrkweme: Mobile phone use among low income Aboriginal people, a central Australian snapshot*. Retrieved from Alice Springs: http://www.clc.org.au/files/pdf/CLC_Tangentyere_Research_Hub_report_on_Mobile_Phone_Use_in_Central_Australia_March_2007.pdf

Taylor, A. (2012a). Information communication technologies and new Indigenous mobilities? Insights from remote Northern Territory communities. *Journal of Rural and Community Development, 7*(1), 59-73. Retrieved from http://www.jrcd.ca/viewarticle.php?id=592&layout=abstract

Taylor, A. (2012b). More than mobile: Migration and mobility impacts from the 'Technologies of Change' for Aboriginal communities in the remote Northern Territory of Australia. *Mobilities, 7*(2), 269-294. doi:10.1080/17450101.2012.654997

Taylor, E. W., & Cranton, P. (2012). *The handbook of transformative learning: Theory, research, and practice* Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10558099&ppg=1

Teacher Education Ministerial Advisory Group. (2014). *Action now: Classroom ready teachers*. Retrieved from https://docs.education.gov.au/node/36783

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioural sciences*. Thousand Oaks: SAGE.

Teddlie, C., & Tashakkori, A. (2010). Overview of contemporary issues in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social & behavioral research* (pp. 1-41). Thousand Oaks: SAGE.

Telstra. (2014). *Making the connection: Essays on Indigenous digital excellence* Retrieved from http://www.vividpublishing.com.au/makingtheconnection/

Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education, 52*(2), 302-312.

doi:10.1016/j.compedu.2008.08.006
Tertiary Education Quality Standards Agency. (2012). TEQSA Glossary of terms – student completion rates Retrieved from http://www.teqsa.gov.au/media-publications/glossary
The Australian Institute for Teaching and School Leadership. (2015). *Initial teacher education: data report 2015*. Retrieved from Melbourne: http://www.aitsl.edu.au/docs/default-source/aitsl-research/insights/2015-ite-data-reportaaf4894d46ab632d8aa7ff0000cdfa8c.pdf
The Australian Institute for Teaching and School Leadership. (nd). ICT statements for graduate standards. Retrieved from http://www.aitsl.edu.au/docs/default-source/apst-resources/teaching_teachers_for_the_future_-_graduate_teacher_standards_-_ict_statements.pdf?sfvrsn=4
The Australian Institute of Aboriginal and Torres Strait Islander Studies. (2014). Indigenous Australians: Aboriginal and Torres Strait Islander people. Retrieved from http://aiatsis.gov.au/explore/articles/indigenous-australians-aboriginal-and-torres-strait-islander-people
Thomson, C. (2011). *Inquiry into Indigenous economic development in Queensland and advisory report on the Wild Rivers (Environmental Management) Bill 2010*. Canberra: Commonwealth of Australia Retrieved from http://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=economics/wildrivers/report.htm.
Thrift, N. (2003). Practising ethics. In M. Pryke, G. Rose, & S. Whatmore (Eds.), *Using social theory: Thinking through research.* (pp. 105-120). London: SAGE. Retrieved from http://site.ebrary.com/lib/flinders/reader.action?docID=10218190.
Tough, A. (1978). Major learning efforts: Recent research and future directions. *Adult Education Quarterly, 28*(4), 250-263. doi:10.1177/074171367802800403
Tough, A. (1979). *The adult's learning projects: A fresh approach to theory and practice in adult learning* (2nd ed.). Ontario: Ontario Institute for Studies in Education.
Townsend, P. B. (2014a, 30 September - 3 October 2014). *Deadly remote teacher education by mobile devices.* Paper presented at the Australian Computers in Education Conference - Now It's Personal: Innovating Education, Adelaide.
Townsend, P. B. (2014b). Mobile Learning Engagement is Location Neutral. *Transactions on Mobile Learning, 3*(5-9). Retrieved from http://research.it.uts.edu.au/tedd/anzmlearn/publications
Townsend, P. B. (2015a). Mob learning - Digital communities for remote Aboriginal and Torres Strait Islander tertiary students. *Journal of Economic & Social Policy, 17*(2), 20. Retrieved from http://epubs.scu.edu.au/jesp/vol17/iss2/2
Townsend, P. B. (2015b). Mobile Devices for Tertiary Study – Philosophy Meets Pragmatics for Remote Aboriginal and Torres Strait Islander Women. *The Australian Journal of Indigenous Education, 44*(Special Issue 02), 139-149. doi:10.1017/jie.2015.26
Townsend, P. B., Halsey, R. J., & Guenther, J. (2016). Mobile Learning Congruencies with Aboriginal and Torres Strait Islander Cultural Philosophies. In J. Orrell & D. D. Curtis (Eds.), *Publishing Higher Degree Research: Making the Transition from Student to Researcher.* (pp. 25-32). Rotterdam: SensePublishers. doi:10.1007/978-94-6300-672-9_3
Tucker, V. (2015). Using social media for student collaboration. *The Journal of Faculty Development, 29*(2), 45-56.
Tuppurainen, R. P. (2006). *The role(s) of the spirit-paraclete in John 16:4b-15: A*

socio-rhetorical investigation. University of South Africa. Retrieved from http://umkn-dsp01.unisa.ac.za/bitstream/handle/10500/1717/thesis.pdf?sequence=1

Underwood, B. D., & Thomson, I. (2015, August). AnTEP Graduation 2015. *AnTEP News*, 2-17.

UniSA College. (2016). Indigenous Participation Pathway program. Retrieved from http://www.unisa.edu.au/Study-at-UniSA/UniSA-College/Explore-our-programs/Indigenous-Participation-Pathway/

United Nations. (2011). *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue*. Retrieved from http://www2.ohchr.org/english/bodies/hrcouncil/docs/17session/A.HRC.17.27_en.pdf

United Nations Educational, Scientific and Cultural Organization. (2012). UNESCO mobile learning publications. Retrieved from http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries/

United Nations Educational, Scientific and Cultural Organization. (2013). *Policy guidelines for mobile learning*. Retrieved from http://unesdoc.unesco.org/images/0021/002196/219641e.pdf

Vaarzon-Morel, P. (2014). Pointing the phone: Transforming technologies and social relations among Warlpiri. *The Australian Journal of Anthropology*. doi:10.1111/taja.12091

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly, 27*(3), 425-478. Retrieved from http://misq.org/misq/downloads/?___store=library

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS quarterly, 36*(1), 157-178. Retrieved from http://vvenkatesh.com/Downloads/Papers/fulltext/pdf/Venkatesh_Thong_Xu_MISQ_forthcoming.pdf

Vignette. (2016). Vignette. *Cambridge Advanced Learner's Dictionary & Thesaurus* Retrieved from http://dictionary.cambridge.org/dictionary/english/vignette

Vosloo, S. (2012). Mobile learning and policies: Key issues to consider. *Working Paper Series on Mobile Learning.* Retrieved from http://unesdoc.unesco.org/images/0021/002176/217638E.pdf

Walker, M., Fredericks, B. L., & Anderson, D. J. (2012, June). *Understanding Indigenous Australian women's social and emotional wellbeing and wellness through yarning: The Indigenous Women's Wellness Program.* Paper presented at the Proceedings of the International Indigenous Development Research Conference 2012.

Warren, A., & Evitt, R. (2010). Indigenous hip-hop: Overcoming marginality, encountering constraints. *Australian Geographer, 41*(1), 141-158. doi:10.1080/00049180903535659

Warumpi Band. (1987). Blackfella whitefella. Sydney: Australian Broadcasting Corporation

Watson, A. H. A. (2011). *The mobile phone: The new communication drum of Papua New Guinea.* (PhD), Queensland University of Technology, Brisbane. Retrieved from http://eprints.qut.edu.au/47170/1/Amanda_Watson_Thesis.pdf

Weber, D. M., & Kauffman, R. J. (2011). What drives global ICT adoption? Analysis and research directions. *Electronic Commerce Research and Applications,*

10(6), 683-701. doi:10.1016/j.elerap.2011.01.001
West, M. (2012). *Mobile learning for teachers: Global themes UNESCO Working paper series on mobile learning* Retrieved from http://unesdoc.unesco.org/images/0021/002164/216452E.pdf
What Works - The Work Program. (2012). *Success in remote schools: A research study of eleven improving remote schools*. Retrieved from Abbotsford: http://www.whatworks.edu.au/upload/1341805220784_file_SuccessinRemoteSchools2012.pdf
Willems, J. (2012). Educational resilience as a quadripartite responsibility: Indigenous peoples participating in higher education via distance education. *Journal of Open, Flexible and Distance Learning, 16*(1), 14-27.
Williams, D., & Chambers, B. (1986). *An evaluation of the Aboriginal Study Grants Scheme*. Canberra: Department of Education.
Williams, J. (2010). Constructing a new professional identity: Career change into teaching. *Teaching and Teacher Education, 26*(3), 639-647. doi:10.1016/j.tate.2009.09.016
Willis, E., Pearce, M., & Jenkin, T. (2005). Adapting focus group methods to fit Aboriginal community-based research. *Qualitative research journal, 5*(2), 112-123.
Witt, R. E., Kebaetse, M. B., Holmes, J. H., Ryan, L.-Q., Ketshogileng, D., Cynthia, A., . . . Nkomazana, O. (2016). The role of tablets in accessing information throughout undergraduate medical education in Botswana. *International Journal of Medical Informatics, 88*, 71-77. doi:10.1016/j.ijmedinf.2016.01.006
World Bank. (2012). *Information and communications for development 2012: Maximizing mobile*. Retrieved from Washington: http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/IC4D-2012-Report.pdf
Wunnava, S. (2015). Mobile commerce usage: Application of Theory of Reasoned Action (TRA) and Technology Acceptance Model (TAM). *World Journal of Social Sciences, 5*(2), 41-50. Retrieved from http://www.wjsspapers.com/static/documents/April/2015/4.%20Shalini.pdf
Yang, K. (2012). Consumer technology traits in determining mobile shopping adoption: An application of the extended theory of planned behavior. *Journal of Retailing and Consumer Services, 19*(5), 484-491. doi:10.4156/jcit.vol8.issue10.118
York, F., & Henderson, L. (2001). "Giving control over destinies": Students['] perspectives of an innovative cross-cultural teacher education program. *International Journal of Instructional Media, 28*(2), 137-145.
York, F., & Henderson, L. (2003). Making it possible : The evolution of RATEP – a community-based teacher education program for Indigenous peoples. *Australian Journal of Indigenous Education, 32*, 77-84. Retrieved from https://www.cambridge.org/core/journals/australian-journal-of-indigenous-education/all-issues
Yunkaporta, T. (2009). *Aboriginal pedagogies at the cultural interface.* (Doctorate of Education), James Cook University, Townsville. Retrieved from http://researchonline.jcu.edu.au/10974/2/01thesis.pdf
Zepeda, S. J., Parylo, O., & Bengtson, E. (2014). Analyzing principal professional development practices through the lens of adult learning theory. *Professional Development in Education, 40*(2), 295-315. doi:10.1080/19415257.2013.821667