1-1-2015

Mob Learning - Digital Communities for Remote Aboriginal and Torres Strait Islander Tertiary Students

Philip B. Townsend
Flinders University

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Abstract

Aboriginal and Torres Strait Islander tertiary students in remote communities are separated by physical distance from their institution and fellow students. The author's current PhD research focusses on Aboriginal and Torres Strait Islander pre-service teachers in remote communities studying Initial Teacher Education through Community Based Programs. Many of these pre-service teachers participate in digital communities by means of mobile devices. Congruencies between constructs of mobile learning and Aboriginal and Torres Strait Islander cultural philosophies are proposed as an explanation for membership of digital communities. Policy implications regarding use of mobile devices in Community Based Programs may increase numbers of graduates.

Keywords

mobile devices, cultural philosophies, indigenous, teacher education, digital communities

Introduction

In this paper the term 'mob learning' has three meanings. In each case 'mob' is a positive term. Firstly, it is noted that in Aboriginal and Torres Strait Islander slang the words 'our mob' can refer in an all-encompassing way to First Nations people as distinct from the rest of Australian society. 'Our mob' can also refer to a particular group within Aboriginal and Torres Strait Islander nations, such as the Wik mob or the Pitjantjatjara mob. This paper is concerned with the learning of an identifiable cohort: Aboriginal and Torres Strait Islander tertiary students. Secondly, 'mob learning' connotes a group and portrays people learning together, as distinct from learning by discrete individuals. The idea of a group can be extended to that of a community. More specifically, this paper looks at the formation of a digital community. Thirdly, 'mob' may be construed as a short form of the word 'mobile'. The paper explores the use of mobile devices – laptops, tablets and mobile phones - and the manner in which their use creates digital communities of Aboriginal and Torres Strait Islander pre-service teachers from remote communities.

This paper has two primary objectives: first, to report briefly on the formation of a digital community and identify factors contributing to the uptake of mobile devices by its members, and the functions of that digital community; second, to focus on describing a new conceptual relationship that aligns features of Aboriginal and Torres Strait Islander cultural philosophies with constructs of mobile learning. The first section gives background about Initial Teacher Education (ITE) through Community-Based Programs. This is followed by a survey of some of the literature regarding use of mobile devices by Aboriginal and Torres Strait Islander people in remote communities, features of Aboriginal and Torres Strait Islander philosophies, and constructs of mobile learning. The third section briefly outlines the methodology of the research before the fourth section reports initial findings with regard to the uptake of mobile devices by pre-service teachers in remote communities and the use of mobile devices in the formation of digital communities. The fifth section is the focus of the paper and discusses possible alignment of cultural philosophies - such as cosmology, ontology, epistemology, and axiology – with a pedagogic framework of mobile learning. It also identifies social and economic policy implications in two areas, such as access to mobile devices, and long term effects, before a conclusion completes the paper.

Background

Initial Teacher Education for Aboriginal and Torres Strait Islander people
The issue which prompts the research is the below parity level of Aboriginal and Torres Strait Islander teachers in the schooling workforce. Currently Aboriginal and Torres Strait Islanders make up about 5 per cent of the school student population, but around 1 per cent of teachers and leaders (McKenzie, Weldon, Rowley, Murphy, and McMillan, 2014, p. 28). This imbalance is a consequence, in part, of the fact that Aboriginal and Torres Strait Islander peoples' completion rates in higher education generally are below those of the rest of the Australian population: 41 per cent to 69 per cent (Behrendt, Larkin, Griew, and Kelly, 2012). ITE is the third highest field of participation for Aboriginal and Torres Strait Islander university students (DIISRTE, 2013), and low completion rates of around 36 per cent are evident (Patton, Hong, Lampert, Burnett, and Anderson, 2012).

One mode of provision of ITE for Aboriginal and Torres Strait Islander people is through Community-Based Programs (CBPs). Common features of such programs are supply of a supervisory teacher, and use of a classroom dedicated as a tertiary study centre. These programs are available in selected remote communities. This research investigates two CBPs, one in South Australia and the other in Queensland. The central purpose of such courses is to enable a person to complete a teaching qualification while remaining in his or her own community, rather than living away in a regional town or capital city.

In 1984 the AnTEP (Anangu Tertiary Education Program) started with the aim to train Pitjantjatjara and Yankunytjatjara people to become school teachers in their own communities in the north-west of South Australia (Edwards and Underwood, 2006). RATEP (Remote Area Teacher Education Program) was established in 1990 to enable Torres Strait Islanders to become teachers. Now Aboriginal and Torres Strait Islander students throughout Queensland participate in RATEP (Osborne, 2003). Both courses lead to a university degree. However, not all students who commence these courses intend to continue to the end. Each course has recognised exit points along the way. Data from RATEP covering the period 2007-2011 indicates a completion rate of about 15 per cent (Mitchell and Linkson, 2012). AnTEP completion rates are anecdotally reported as very low.

Given this background and recognising the global trend for the use of mobile devices in teacher training (UNESCO, 2014; Vosloo, 2012; West, 2012), it is appropriate to ascertain the views and practices of Aboriginal and Torres Strait Islander pre-service teachers about uses of mobile devices in their study through

CBPs. The following section briefly surveys literature in these areas: use of mobile devices by Aboriginal and Torres Strait Islander people in remote communities, features of Aboriginal and Torres Strait Islander philosophies, and constructs of mobile learning.

Literature review

Use of mobile devices by Aboriginal and Torres Strait Islander people in remote communities

Discrete indigenous communities are specific geographic settlements in which people usually have traditional and / or historic relationships to the surrounding land and to one another. There are about one thousand one hundred such communities; many of these have less than one hundred inhabitants and most are in areas classed as remote or very remote (ABS, 2011, p. 6). Hunt mentions competing rights and interests between groups in communities (2013, p. 9). Complex issues can lead to communities being labelled as disadvantaged (SCRGSP, 2014) and as having poor indices of wellbeing (Biddle, 2014). Nevertheless, about 8 per cent of Aboriginal and Torres Strait Islander people choose to live in remote areas and about 14 per cent live in very remote communities (ABS, 2013). Biddle points out that wellbeing is enhanced through living in these communities because doing so enables access to country and traditional lands, provides opportunities to engage in customary activities, and reinforces ongoing kinship ties (2014, p. 67).

In remote communities young Aboriginal and Torres Strait Islander people engage with digital technology to create culturally relevant media productions, new forms of literacy, and participate in globalised youth culture (Auld, Snyder, and Henderson, 2012; Kral, 2010; Taylor, 2012). They use social media, make online purchases, do Internet banking, and "are skilled and clever participants in both the local and global world…" (Kral and Schwab, 2012, p. 51). More recently Kral stated "…communication via mobile phones and social networking has rapidly become the norm for Indigenous youth …" (Kral, 2014, p. 1). However, not all remote communities have mobile phone coverage or Internet access, yet in coming years, services are expected to improve (BFBA, 2013; RTIRC, 2012). So too, it is anticipated that higher education institutions will increasingly utilise mobile devices for teaching and learning (Johnson, Adams Becker, Cummins, and Estrada, 2014; Johnson, Adams Becker, Estrada, and Freeman, 2014).

Given the popularity of mobile devices for Aboriginal and Torres Strait Islander people the question arises: Are there aspects of their cultures which foster the

uptake of mobile devices and creation of digital communities? One potential avenue to explore is that of Aboriginal and Torres Strait Islander pedagogies or ways of learning and teaching. It should be recognised that the notion of Aboriginal and Torres Strait Islander pedagogy is contested (Nakata, Nakata, Keech, and Bolt, 2012; Nakata, 2007). Space limitations prevent this issue being explored here. Aboriginal pedagogical systems and Information Communications Technology pedagogical systems have been compared and overlapping commonalities observed (see Table 1 below).

Table 1: Comparison of Aboriginal and ICT pedagogies.

Aboriginal pedagogy	ICT pedagogy
Learning through experiencing concepts	Learning through experimentation
Peer or group learning	Can allow group space
Space for own investigation	Allows them to investigate in their own time
Adapt to local context	Learning can be contextualised
Community can direct aspects in their local practices	Learning can be flexible and the design can adapt tasks to specified outcomes

Source: (Donovan, 2007, p. 99)

More recently other authors have drawn attention to alignments between Yunkaporta's "8 way" model of Aboriginal pedagogy (Yunkaporta, 2009) and social media (see Table 2 below).

Table 2: Aligning '8 Ways' with Social Media Tools.

"8 Ways"	Social Media Tools (& Mobile Tools)
Story Sharing	Collaborate, MS Lync, Skype, YouTube, Vimeo
Community Links	Collaborate, MS Lync, Skype, YouTube, Vimeo
Deconstruct / Reconstruct	Discussion forums, Chatrooms
Non-Linear	a-synchronous discussion forums, Facebook, Twitter, YouTube, Flicker
Land Links	Facebook, YouTube, Flicker, Vimeo
Symbols & Images	Facebook, YouTube, Flicker, Vimeo
Non-Verbal	YouTube, Flicker, Vimeo

Learning Maps	Collaborate, A-synchronous discussion forums

Source: (Huijser and Bronnimann, 2014, p. 106)

These comparisons will not be discussed in detail, but can be taken to suggest cultural philosophies might promote the use of mobile technologies for study purposes. An overview of Aboriginal and Torres Strait Islander philosophies is presented in the next section.

Features of Aboriginal and Torres Strait Islander philosophies

There is a fundamental premise of relatedness underlying many Aboriginal and Torres Strait Islander cultures, as expressed in the following quote: "… the essential feature of relatedness is constant …" (Martin, 2008, p. 69). It would be a misrepresentation to suggest that all Aboriginal and Torres Strait Islander groups had the same beliefs and practices in the past or today. However, commonalities exist, particularly among people in remote communities using local vernaculars, and these provide the unique context affecting the uptake of mobile devices for tertiary study by pre-service teachers living in remote communities. Cultural perspectives will be examined by looking at four areas: Cosmology: view of the universe – physical and spiritual realities; Ontology: view of identity / being; Epistemology: view of knowledge; Axiology: view of values. However, the boundaries between these four areas should not be seen as fixed and impermeable but porous, and specific matters can be viewed as flowing between two or more areas (Arbon 2014, personal communication). The perspective of one writer, Veronica Arbon, is highlighted. Her work is chosen as it describes the worldview of the Arabana people who are desert people who border the Pitjantjatjara and Yankunytjatjara (for whom AnTEP was established). It is acknowledged that her views are not necessarily representative of all First Nations people in Australia.

Arbon uses a vernacular term, 'Ularaka', to express notions of cosmology, worldview and Dreaming when she writes "The **Arabana Ularaka**, like the worldviews of other Indigenous people, is fundamentally important in this effort to see the world from a position of relatedness" [emphasis in the original] (Arbon, 2008, p. 30). Other Aboriginal and Torres Strait Islander groups also see the universe as comprising multiple relationships, as indicated in the following quote: "The Universe is known as inherently dynamic, constantly changing in a process of renewal, and profoundly interrelated" (Arabena, 2008, p. 1). Within Indigenous frameworks a sense of being is construed only with reference to a group. "In our

critical complex ontology a human being simply can't exist outside the inscription of community …" (Kincheloe, 2006, p. 192). Arbon indicates that a sense of being has three primary characteristics: it is embodied, reciprocal and related (Arbon, 2008, pp. 32-37). Other Aboriginal and Torres Strait Islander writers speak similarly: "… 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).

According to Arbon (2008) there are three aspects to knowing: it is experienced, organised and controlled (Arbon, 2008, p. 48). Nakata stated "Indigenous peoples hold collective rights and interests in their knowledge ..." (Nakata, 2007, pp. 185f). Under these philosophies, matters that are important and valued lead to action. Arbon claims doing is engaged, interpretive and understanding. "Our Indigenous societies are very clearly founded within and on the symbolic, performative and interpretational, where dialogue, mentoring and responsibility are critical to doing" (Arbon, 2008, p. 53). A representation of Arbon's perspective is shown in Figure 1 below:
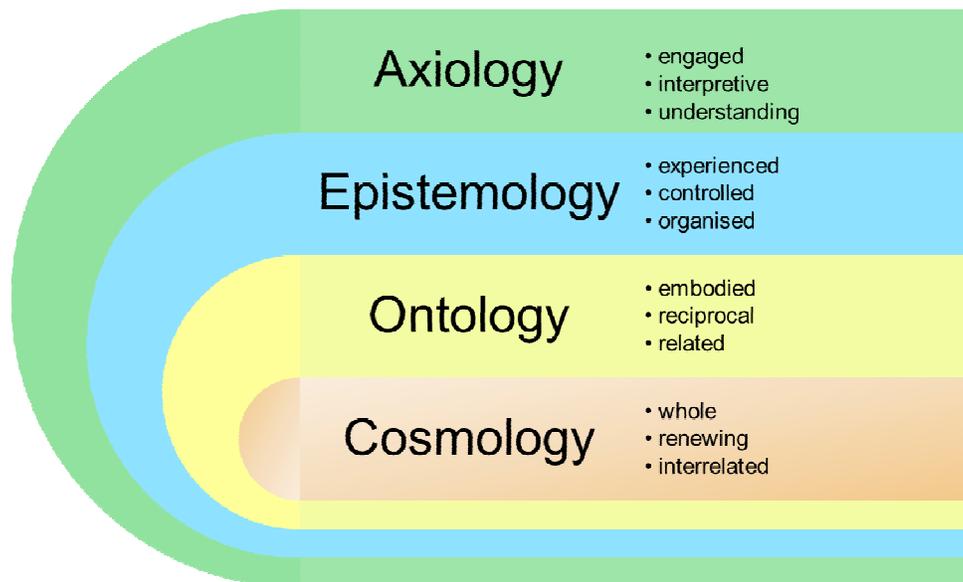

Figure 1: Arabana worldview perspective

Adapted from Arbon (2008)

Given that the pre-service teachers in the research are all Aboriginal and Torres Strait Islander people, then it can be posited that aspects of cultural philosophies influence their desire to use mobile devices as part of their ITE study, while living in remote communities. The following section presents one view of mobile learning.

Constructs of mobile learning

This pedagogical framework of mobile learning has been selected for two reasons: it focuses on the learner's perspectives rather than the affordances of the mobile devices themselves, and because it was developed within the context of teacher education (Kearney, Schuck, Burden, and Aubusson, 2012) (see Figure 2 below).
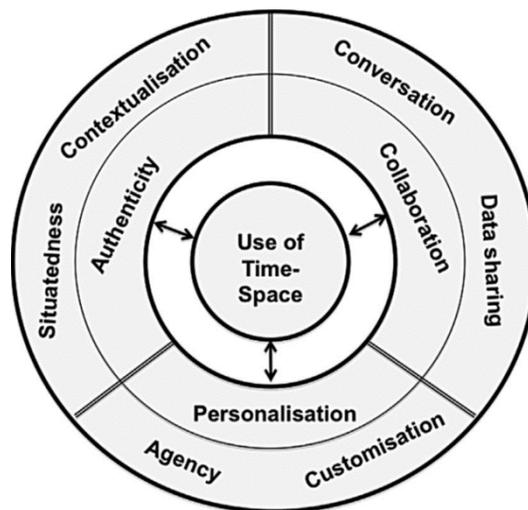
Figure 2: A pedagogic framework of mobile learning.

Source: Kearney et al., 2012, p. 8

At the centre is what the authors describe as 'malleable spatial-temporal contexts of learning'. They suggest there is a two-way interaction between mobile learning experiences and the use of space and time. The framework indicates three main constructs of mobile learning: authenticity, collaboration and personalisation. These are further broken down to yield a total of six sub-constructs: situatedness, contextualisation, conversation, data sharing, agency and customisation. Each of

these six factors is likely to be present at some level in any mobile learning context (Kearney and Burden, 2014).

Authenticity of learning with mobile devices occurs when the learner is participating in a real 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 exchange). 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 the approach to the research.

Methods

A Mixed Methods Research approach was used for the wider PhD research project. This paper reports only issues arising from initial qualitative data. All the participants were Aboriginal and Torres Strait Islander people, most of whom were pre-service teachers from two CBPs, as well as some Aboriginal and Islander Education Workers not enrolled in an ITE course. Semi-structured face-to-face interviews were held with individuals and focus groups. Interviews were conducted in English with audio recording from which transcripts were made.

Data was obtained from fifteen sites: five in South Australia and ten in Queensland. Overall there were 64 volunteer informants (55 females and 9 males in 27 individual interviews, 4 focus groups and 18 joint interviews). At the start of the investigation the researcher did not know whether pre-service teachers were using mobile devices in their study. A set of thirteen questions were used in the interviews. These were designed to meet four objectives: to reveal ways in which the use of mobile devices in the training of pre-service teachers in remote communities could affect the professional learning of an ITE qualification; to identify the affordances of the use of mobile technologies in the training of pre-service teachers in remote communities, as perceived by pre-service teachers themselves, which have andragogical impact on the delivery of training; to generate new knowledge about the alignment of Aboriginal and Torres Strait Islander philosophical perspectives and features of mobile learning; to enable pre-service teachers to voice which elements of content material, administrative support and personal encouragement for their ITE study they wish to see provided through mobile devices. Participants could choose not to answer all questions and withdraw at any time.

Findings

The data suggests there is a distinction between pre-service teachers in South Australia and Queensland. The following table (Table 3) restricts data to current pre-service teachers and graduates who had finished their course in the past three years, and shows their uptake of mobile devices by state.

Table 3: Use of Mobile Devices by Pre-Service Teachers & Graduates by State

Informants using mobile devices for study			
	Yes		No
Qld	28		1
SA	0		17

The South Australian pre-service teachers were not using mobile devices for their study. This appears to be based on the nature of assignment tasks to date which have not utilised their existing strengths and skills in social uses of mobile devices in contexts without mobile network service or mobile Internet access. Moreover the use of the institutional online learning management system has not been compulsory. Hence, these South Australian students are not familiar with online learning tasks. They do not have skills in this area which could be transferred from desk top computers to the affordances of mobile devices in contexts where access and coverage exist. This paper will not comment further on South Australian data. In contrast, pre-service teachers in Queensland are using mobile devices in their study, despite this not being mandatory for their course, and they formed a digital community. Their perspectives and experiences are detailed below.

Uptake

Interview data indicate that portability, tactile functionality, multiple postures in use and interactive software are features of mobile devices which make them engaging and have personalised learning for these pre-service teachers. Other comments reveal they now are not restricted to the study centre as the only site for

their learning. Rather, they have freedom to choose a variety of places where they study using mobile devices. In addition, the use of mobile devices gives them flexibility over the times they pursue their learning. This helps to overcome barriers such as when employment clashes with the opening hours of the study centre, or when sickness prevents them attending the study centre, or when a person has to leave their own community for various reasons. Use of mobile devices gives pre-service teachers autonomy over the time they choose to study – it is not restricted to business hours / 'clock times'. These perspectives demonstrate the benefits of incorporating mobile devices into their study perceived by the pre-service teachers.

Digital community

Pre-service teachers in RATEP personalised their study through using mobile devices. They took the initiative to form digital communities of learning and practice. Initially this was informal and between students. It spread to include staff – supervisory teachers, administrative officers and lecturers – and received endorsement by the course provider. The digital community is expressed in three functions: academic support, administrative procedures and personal encouragement.

Student reported seeking academic assistance from other students, such as this comment on the following page:

> We've integrated through Facebook. If I'm having issues with something I'll put it on - maybe write [to] a couple of my friends [and] say 'Hey have you guys done this unit? If so where are yous at? I'm having troubles with this task. Are yous up to there?'

Another pre-service teacher spoke about the cooperative approach to study: "They all get on to Facebook … when they're collaborating with each other and exchanging ideas …" These quotes illustrate the way pre-service teachers spontaneously used the digital literacy skills regarding mobile devices they already possessed, and took the initiative to incorporate these within their approach to professional tertiary study.

Several pre-service teachers mentioned they had customised their mobile phones to deal with administrative procedures about their study. They reported re-routing emails so they came directly to their mobile phones. One student said:

> I'm someone who doesn't check me e-mails much, but if it comes to me phone I've always got that with me, and I'll see that I've got a new email. If something's due, or they need to talk to me about something, I can look at it straight away.

Another student affirmed "I get all the administrative supports - if I passed the task or if I need to resubmit - I get it all sent to my phone. It works really well for me."

Mobile devices were used to share personal encouragement and develop a support network between students. A pre-service teacher said "I use Facebook and other alternatives to get in contact with my mates and see how they're going and [they] see how I'm going." Another person mentioned the importance to students of "… having confidence that the [supervisory teacher] is really working to ensure [he / she] understand[s] those background issues and helping wherever they can."

The qualitative data demonstrates an active digital community facilitated by mobile devices, which began among pre-service teachers, but now also includes supervisory teachers, administrative personnel and lecturing staff with the course provider. Pre-service teachers use laptops, tablets and mobile phones to participate in this digital community. Communication happens through various modes, such as talk, text, emails and social media. The digital community exists for several purposes – it enables academic support, fulfils administrative procedures and fosters personal encouragement. In the following section the question is posed: In what ways do Aboriginal and Torres Strait Islander cultural philosophies promote the use of mobile devices and foster the creation of a digital community?

Discussion

A cultural philosophical critique of a pedagogic framework of mobile learning

The findings indicated mobile devices are popular with the pre-service teachers in the research and RATEP students initiated digital communities of learning and practice. This section details a possible explanation for such behaviour based on congruencies between the pedagogic benefits of mobile learning and cultural philosophy. As indicated earlier, the work of Veronica Arbon will be used as an example of an Aboriginal cultural philosophical perspective. She states "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" [emphasis in the original] (Arbon, 2008, p. 26). Hence, the pedagogic framework is placed within the cultural philosophies which are represented as concentric circles, as shown in Figure 3 below. This graphically represents privileging of the cultural philosophies over the pedagogic framework.
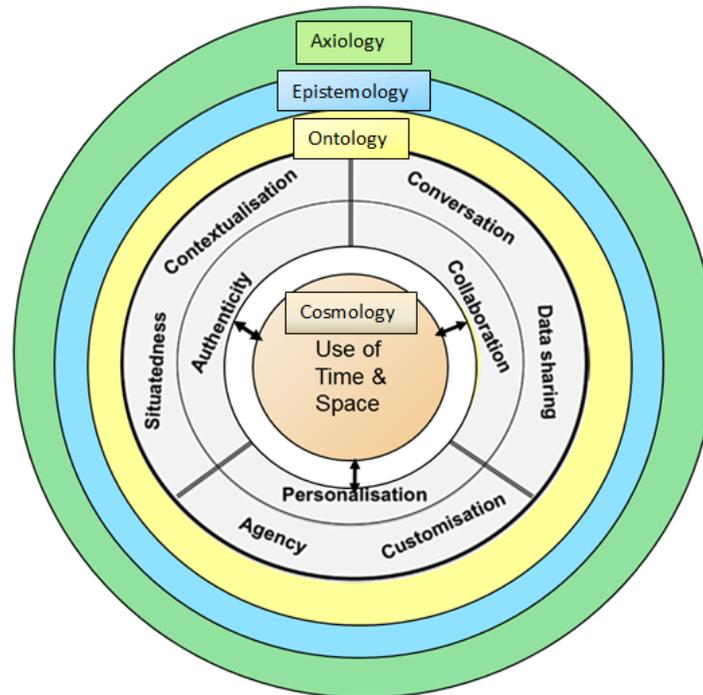

Figure 3: Cultural philosophies critiquing a pedagogic framework of mobile learning

The paper will examine the three areas of authenticity, conversation and personalisation in the light of cultural philosophy. First though, the use of space and time will be considered. Kearney and colleagues suggest

> …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
> also relaxed enabling the individual to be more flexible about when they
> learn… (2012, p. 4)

Do these views fit with cosmology? For Aboriginal and Torres Strait Islander people cosmology involves ancestors, stories / Dreaming, people, spirit beings,

land / country, and the physical world. Arbon characterises cosmology as whole, renewing and interrelated. She points out 'For the **Arabana**, relatedness is where time and space is collapsed and organised' [emphasis in original] (Arbon, 2008, p. 35), in effect, '…bringing the ancient and today together …' (Arbon, 2008, p. 36). The creation of virtual and non-geographic spaces which can be accessed through mobile devices resonates with these aspects of Aboriginal cosmology. Aboriginal cosmology generally views time as non-linear. It may be described as quasi-cyclical and serve to fuse the past and the present, while a focus on events yet to come inaugurates the future into the present. Arbon explains 'Knowing is about experience as generations cycle through generation levels and yesterday becomes today in experience which locate and define responsibilities …' (Arbon, 2008, p. 41). Kearney and his co-researchers stated ' … fixed notions of linear time are increasingly making way for a softer version of what some authors have termed 'socially negotiated time' …' (Kearney et al., 2012, p. 4). These 'malleable' or 'softer' views of time are congruent with perspectives of time within Aboriginal cosmology. The use of time and space will be mentioned again regarding personalisation.

There is a positive fit between the authenticity factors of situatedness and contextualisation and cultural philosophies. The comments of the pre-service teachers indicate 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 and associates as situatedness. Where learning through mobile devices occurs when it is not contrived or artificial but realistic and relevant to the learner, then Kearney and his fellow researchers call this contextualisation. An example is that of pre-service teachers using 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.

Several possible alignments with Aboriginal and Torres Strait Islander philosophies and the sub-scales of situatedness and contextualisation under the construct of authenticity are presented in Figure 4 below.
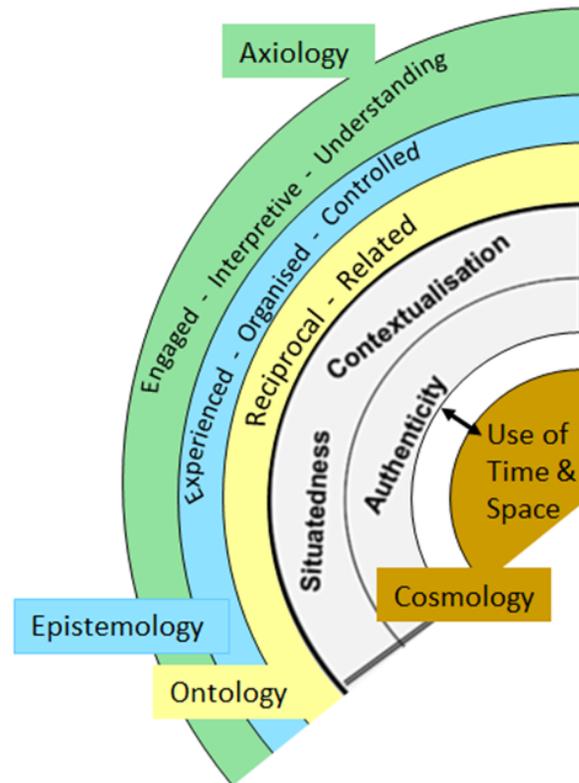
Figure 4: Cultural philosophies critiquing the construct of authenticity

Cultural ontology, as described by Arbon, emphasises that a sense of identity is formed through being related. Arbon asserts 'Relatedness is central to being as **Arabana**' [emphasis in original] (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 avers 'For the **Arabana,** becoming who you are is accomplished by knowing your reciprocal relationships' [emphasis in original] (Arbon, 2008, p. 34). The course requirement to work in partnerships to assist one another 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 states '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 it 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 these '… are critical to organisation for knowing'; she avows '…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. Another aspect of epistemology is explained by Arbon who maintains 'Knowing is controlled to ensure appropriate access to some areas of knowledge and knowing' (Arbon, 2008, p. 48). 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 talks about 'right action' and that people have a responsibility to ensure 'the appropriate outcome' (Arbon, 2008, p. 51f). 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.

The first construct of authenticity (with the sub-scales of situatedness and contextualisation) has been critiqued in detail to ascertain alignment with elements of cultural philosophies. Due to space limitations, the other two constructs of collaboration and personalisation will not be examined to the same extent, and summary comments about convergence are presented.

The collaboration factors of conversation and data-sharing also match cultural philosophies. Pre-service teachers mentioned their use of mobile devices to share personal encouragement. Kearney and his team would describe this as an example of conversation with rich peer interactions. It fits with the cultural feature of axiology as seeking true understanding, the feature of epistemology as experienced, and arises from the feature of ontology of a deep level of intimate relationship. Interview participants spoke of using mobile devices to both seek and offer academic support. In the framework of Kearney and his co-workers this is an example of data-sharing (both at a simplistic transmission level and also to the extent of co-construction of new material). It fulfils the ontological feature to be reciprocal, the epistemological feature to be organised and the axiological feature to be interpretive.

The personalisation factors of agency and customisation align with cultural philosophies. At this point I refer again to control over place, pace and time. 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 sport training, or late at night when other family members had gone to sleep. Agency might align with the ontological feature to be embodied, the epistemological feature to be controlled and the axiological feature to be engaged. Customisation can occur at both a device and activity level. Some pre-service teachers mentioned they had selected features of a mobile device to highlight their personal preferences, particularly with regard to administrative requirements - such as redirecting emails to a mobile phone, or placing reminders in diaries about assignments. Customisation ties in with the ontological feature to be embodied, the epistemological feature to be controlled and the axiological feature to be interpretive.

This use of Arbon's perspective of cultural philosophies to critique the pedagogic framework of mobile learning presented by Kearney and colleagues has demonstrated significant congruence. The following section identifies policy implications.

Social and economic policy implications

The spontaneous uptake of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers studying ITE through Community Based Programs in remote communities and the creation of digital communities for professional

learning raises social and economic policy implications. Due to space restrictions this paper will address only two implications: access to mobile devices, and possible long term effects.

Access to mobile devices

Many of the research participants used their own money to purchase mobile devices. Some had done this specifically to assist them in their professional studies, as they could foresee benefits to their learning progress. They know in recent years the national government issued laptops to senior secondary school students and some universities provide free tablets to specific cohorts. They asked 'What about us?' Course providers are faced with at least three policy choices: issue a common device free or on hire, offer cash subsidies to students for purchase of a device, or encourage students with Bring Your Own Device (BYOD).

In the national context of financial cutbacks to government funding for the higher education sector, it is likely course providers will opt for the last option. Promoting BYOD saves the institution the cost of buying devices and software for cohort members. So too it saves on finances related to support and maintenance of prescribed material. However, access, equity and social justice issues arise where some students do not have personal funds to get their own devices or pay for ongoing coverage and Internet services. Data from the research indicates students without mobile devices are disadvantaged in their study. Thus, it is incumbent on institutions to establish criteria for assistance and set aside funds for this purpose.

Long term effects of mobile devices and digital communities

The Discussion indicated congruence between aspects of cultural philosophies and mobile learning constructs. This alignment fosters motivation to use mobile devices. The research data indicate use of mobile devices contributes to stronger engagement with study. Given enhanced engagement, it will be appropriate for course providers to monitor over several years the impact of the use of mobile devices and digital communities on key metrics, such as level of grades, retention rates and completion rates. If completion rates increase, then there will be a larger pool of qualified Aboriginal and Torres Strait Islander graduates who could become registered teachers, and who could then be employed in their own or other remote communities or elsewhere. Patton and colleagues point to the social agenda: "Increasing the number of Aboriginal and Torres Strait Islander teachers

is considered an issue of social justice, social change and social inclusion" (2012, p. 14).

The alignment of cultural philosophies and mobile learning constructs that promotes use of mobile devices in ITE through Community Based Programs, may contribute to increasing numbers of Aboriginal and Torres Strait Islander teachers.

It is likely that having more Aboriginal and Torres Strait Islander teachers in remote communities will improve schooling outcomes for the pupils, in two ways. This may occur through the stabilisation of the school work force, by reducing the impact of high levels of rapid turnover of non-Aboriginal and Torres Strait Islander teachers in remote communities, as local teachers are likely to remain in their own communities for extended periods (MCEECDYA, 2010a, p. 22). There could be significant economic savings relating to non-local staff turnover. Secondly, Aboriginal and Torres Strait Islander teachers have deep cultural understandings and are able to support pupils' learning in what is otherwise a mainly Westernised mode of formal education (Giles, 2010, p. 63; ProductivityCommission, 2012, p. 260f).

These social and economic policy decisions about access to mobile devices will have an immediate bearing on the equity of participation of Aboriginal and Torres Strait Islander tertiary students in remote communities. These decisions may have long term effects to increase numbers of Aboriginal and Torres Strait Islander graduates and school teachers, thereby enhancing the likelihood that outcomes of improved school education for children in remote communities will flow on to their adult lives.

Conclusion

The research data demonstrated that Aboriginal and Torres Strait Islander pre-service teachers studying Initial Teacher Education through Community-Based Programs while living in remote communities used mobile devices and formed digital communities. These digital communities were comprised of fellow students, supervisory teachers, institutional administrative staff and lecturers. Pre-service teachers in these digital communities were actively involved in soliciting and providing academic support, fulfilling administrative requirements, as well as seeking and offering personal support.

Aboriginal and Torres Strait Islander pre-service teachers took the initiative to form these digital communities, and have maintained them at their own expense. This paper explored the issue of culture as a factor affecting the adoption of technology. A pedagogic framework of mobile learning was critiqued through consideration of one Aboriginal and Torres Strait Islander perspective of cultural philosophies. Alignments were demonstrated between features of the framework of mobile learning, and elements such as cosmology, ontology, epistemology and axiology.

Future research could investigate epistemology by exploring distinctions between formal and informal learning contexts for Aboriginal and Torres Strait Islander people. Qualitative data from interviews will need to be analysed to detect nuances regarding the influence of cultural philosophies on the use of mobile devices. A further step will be to conduct a survey with these participants and with an enlarged pool of respondents to ascertain their views about ways in which cultural philosophies impact the integration of mobile devices by Aboriginal and Torres Strait Islander pre-service teachers studying Initial Teacher Education through Community-Based Programs in remote communities.

References

ABS. (2011). *Australian Statistical Geography Standard (ASGS): Volume 2 - Indigenous Structure*. (ABS Catalogue No. 1270.0.55.002). Retrieved from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/FE2D2D707996F20ACA25791000152669/$File/1270055002_july%202011.pdf.

ABS. (2013). *Estimates of Aboriginal and Torres Strait Islander Australians, June 2011. Cat. No. 3238.0.55.001. Retrieved 6 December 2013 from.* Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/3238.0.55.001

Arabena, K. (2008). Indigenous epistemology and wellbeing: Universe referent citizenship. In G. Ward (Ed.), *Research Discussion Paper*. Canberra: AIATSIS.

Arbon, V. (2008). *Arlathirnda Ngurkarnda Ityirnda Being-Knowing-Doing: De-Colonising Indigenous Tertiary Education*. Teneriffe: Post Pressed.

Auld, G., Snyder, I., and 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.

Behrendt, L., Larkin, L., Griew, R., and 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.

BFBA. (2013). A mobile NBN needed for remote Australia Retrieved 11 November 2013, from http://broadbandforthebush.com.au/wp-content/uploads/2013/11/20131110_B4BA-_A-mobile-NBN-needed-for-remote-Australia-final-version.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

DIISRTE. (2013). Summary of the 2012 full year higher education student statistics

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.

Edwards, W., and Underwood, B. (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): Berghahn Press.

Giles, W. (2010). Teacher education in a remote community: Learning on the job. *Asia-Pacific Journal of Cooperative Education, 11*(3), 57-66.

Huijser, H., and Bronnimann, J. (2014). Exploring the opportunities of social media to build knowledge in learner-centered Indigenous learning spaces. *Educating in Dialog: Constructing meaning and building knowledge with dialogic technology, 24*, 97.

Hunt, J. (2013). *Engaging with Indigenous Australia— exploring the conditions for effective relationships with Aboriginal and Torres Strait Islander communities*. (Issues paper no. 5 produced for the Closing the Gap Clearinghouse). Canberra & Melbourne: Retrieved from http://www.aihw.gov.au/uploadedFiles/ClosingTheGap/Content/Publications/2013/ctgc-ip5.pdf.

Johnson, L., Adams Becker, S., Cummins, M., and Estrada, V. (2014). 2014 NMC Technology Outlook for Australian Tertiary Education: A Horizon Project Regional Report. Austin: The New Media Consortium.

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2014). NMC Horizon Report, 2014 Higher Education Edition. Austin: The New Media Consortium.

Kearney, M., and Burden, K. (2014). *Investigating distinctive pedagogies in mobile learning*. Paper presented at the Society for Information Technology & Teacher Education International Conference 2014, Jacksonville, Florida, United States. http://www.editlib.org/p/131013

Kearney, M., Schuck, S., Burden, K., and Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Research in Learning Technology, 20*. doi: DOI: 10.3402/rlt.v20i0/14406

Kincheloe, J. L. (2006). Critical Ontology and Indigenous Ways of Being: Forging a Postcolonial Curriculum. In Y. Kanu (Ed.), *Integrating Aboriginal Perspectives Into the School Curriculum: Purposes, Possibilities, and Challenges* (pp. 181-202). Toronto: University of Toronto Press.

Kral, I. (2010). Plugged in: Remote Australian Indigenous Youth and Digital Culture: Centre for Aboriginal Economic Policy Research.

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.

Kral, I., and 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

Martin, K. L. (2008). *Please knock before you enter: Aboriginal regulation of Outsiders and the implications for researchers*. Teneriffe: Post Pressed.

MCEECDYA. (2010a). *The Aboriginal and Torres Strait Education Action Plan 2010-2014*. Carlton South Retrieved from http://www.mceecdya.edu.au/verve/_resources/a10-0945_ieap_web_version_final2.pdf.

McKenzie, P., Weldon, P., Rowley, G., Murphy, M., and McMillan, J. (2014). Staff In Australia's Schools 2013: Main Report On The Survey.

Mitchell, G., and Linkson, M. (2012). *RATEP - Community Based Teacher Education*. Paper presented at the MATSITI Teachers are deadly! conference, Adelaide. http://matsiti.edu.au/ratep/

Nakata, M., Nakata, V., Keech, S., and Bolt, R. (2012). Decolonial goals and pedagogies for Indigenous studies *Decolonization: Indigeneity, Education & Society, 1*(1), 120-140.

Nakata, M. N. (2007). *Disciplining the savages: Savaging the disciplines*. Canberra: Aboriginal Studies Press.

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.

Patton, W., Hong, A. L., Lampert, J., Burnett, B., and Anderson, J. (2012). Report into the Retention and Graduation of Aboriginal and Torres Strait Islander Students Enrolled in Initial Teacher Education Adelaide: University of South Australia.

ProductivityCommission. (2012). *Schools Workforce, Research Report*. Canberra.

RTIRC. (2012). *2011–12 Regional Telecommunications Review - Regional Communications: Empowering Digital Communities*. Canberra: Commonwealth of Australia, Regional Telecommunications Independent Review Committee, Retrieved from http://www.rtirc.gov.au/files/2012/06/Regional_Communications-Empowering_digital_communities.pdf.

SCRGSP. (2014). *Overcoming Indigenous Disadvantage: Key Indicators 2014*. Canberra: Retrieved from http://www.pc.gov.au/research/recurring/overcoming-indigenous-disadvantage/key-indicators-2014.

Taylor, A. (2012). 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.

UNESCO. (2014). UN 2014 Teaching and Learning, Achieving quality for all *EFA Global Monitoring Report, 2013/4*. Paris.

Vosloo, S. (2012). Mobile Learning and Policies: Key Issues to Consider. *Working Paper Series on Mobile Learning* Retrieved 15 September 2012, from http://unesdoc.unesco.org/images/0021/002176/217638E.pdf

West, M. (2012). Mobile learning for teachers: Global themes. *UNESCO Working paper series on mobile learning.* Retrieved 20 June 2012, from http://unesdoc.unesco.org/images/0021/002164/216452E.pdf

Yunkaporta, T. (2009). *Aboriginal pedagogies at the cultural interface.* (Doctorate of Education), James Cook University. Retrieved from http://researchonline.jcu.edu.au/10974/2/01thesis.pdf