Impact of accessible eBooks on learning outcomes of Indigenous students

Final Report 2014

Lead institution: Macquarie University

Partner institutions: Charles Darwin University, Batchelor Institute of Indigenous Tertiary Education

Authors: Sharon Kerr, Judith Booth and Thomas Kerr

Project Leads: Sharon Kerr, Andrew Lovell-Simons and Roslyn Sackley

Team: Andrew Lovell-Simons, Roslyn Sackley, Sharon Kerr Peter Stephenson, Damien Jones, Judith Austin, Terry Dunbar and Susan Page

Project webpage: http://staff.mq.edu.au/teaching/projects/indigenous_ebooks/

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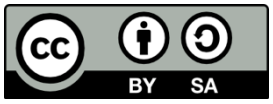

Requests and inquiries concerning these rights should be addressed to:
Office for Learning and Teaching
Department of Education

GPO Box 9880,
Location code N255EL10
Sydney NSW 2001

<learningandteaching@education.gov.au>

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List of acronyms used

ACIKE Australian Centre for Indigenous Knowledges and Education

MQAS Macquarie University Accessibility Services

OLT Office for Learning and Teaching

LTC Learning and Teaching Centre at Macquarie University

Executive summary

This project developed eBooks customised to the learning needs of students studying courses/units of study through the Australian Centre for Indigenous Knowledges and Education (ACIKE), a joint initiative of Charles Darwin University and Batchelor Institute of Indigenous Tertiary Education, and Warawara, an academic Indigenous studies department within Macquarie University.

As the eBooks were developed using Universal Design principles, students with either sensory or learning disabilities are able to access learning materials using the assistive technologies built into the hand-held devices. This removes the necessity for students to identify that they have a disability, or to seek out special assistance.

This project was based on concerns raised since 2007 to Macquarie University Accessibility Services (MQAS), of issues surrounding Indigenous students with disability not presenting for the same level of assistance as the general student body, a pilot study lead by Roslyn Sackley in 2011, entitled “Indigenous Students and Access Ability”, and consultations with colleagues based at ACIKE.

The development and delivery of the curriculum on these hand-held devices had a positive impact on the three campuses that participated in the trial, according to feedback received from the course convenors. All campuses responded extremely favourably to this initiative. Students were initially tentative, but developed confidence in using the technology and engaged more thoroughly with their reading and learning materials. All students accessed the assistive technologies in the preliminary training sessions and during subsequent use, with the text-enlarging Zoom feature being most readily used.

Outcomes and Deliverables

Teaching staff from Charles Darwin University and Batchelor Institute supported MQAS who worked intensively on developing the materials so that they appeared as an off-line website with the same capacity and interactivity as is available to online users with high capacity broadband. This is the first time that courses have been developed and delivered in this manner. The project team anticipates that analysis of the outcomes will provide a valuable blueprint for the development and future delivery of curriculum to remote areas.

Due to ethical considerations, students were provided with their learning materials in a traditional print-based format as well as on the hand-held devices. From both trainer and convenor observations, it was apparent that students and staff were keen to use the unit version provided on the hand-held devices used in this study.

The following outcomes, as outlined in the grant proposal, have been achieved,

- Students were able to access an entire multi-media rich curriculum on dedicated hand-held devices without needing access to the Internet.
- As Universal Design principles were employed in the design of the eBooks, all students, including those with an undisclosed disability were able to access the learning materials using the range of assistive technologies included on the hand-held devices.
- As a further consequence of the use of Universal Design principles, disability support services did not need to budget for converting inaccessible materials, thereby freeing up funding for other initiatives.
- Student engagement and participation were improved with a higher success rate in transition to full studies.

- Students developed self-esteem relating to their capacity as independent learners using hand-held technologies.
- Students developed strategies for learning as a direct result of exposure to a variety of learning materials presented to them on their hand-held device.
- Students had the opportunity to develop a greater sense of community with other learners using social media applications through their hand-held devices when and where Internet was available.
- Students are now able to act as capacity builders in their communities by demonstrating the use and value of these new technologies for accessing learning, and overcoming personal access issues.

In addition, a **short video** was produced that includes an overview of the project and its outcomes from the point of view of the three key project team members: Sharon Kerr, Project Leader, Andrew Lovell Simons, Education Developer, and Roslyn Sackley, Indigenous accessibility Consultant. The video can be viewed on the eBooks project webpage located at: http://staff.mq.edu.au/teaching/projects/indigenous_ebooks/

Recommendations:

The primary recommendation is that data continue to be collected by the three institutions using the content and devices developed for the purpose of this trial and that funding be provided for a more widespread study of courses with high Indigenous enrolments.

As access to the hand-held technologies is a key requirement for this research, it is recommended that further investigation be undertaken by institutions such as the University of Western Sydney, where all students are issued with a device in their first year of study. This will avoid barriers to participation created by the need to find private funding for devices.

Summary

This project makes a positive contribution to the provision of equitable access to education for Indigenous students studying at tertiary level. The use of designed-for-purpose software on standalone devices is a first for education in this specific area and it gives direction to further exploration of ways of using these and other emerging educational technologies for the benefit of Indigenous education in Australia.

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Chapter 1: Background to the concept of disability with Indigenous communities

This chapter, written by Judith Booth, is a review and discussion of the literature on Australian Indigenous *people* in relation to disabilities and Australian Indigenous *students* in higher education from the period 1995 to 2010. There are a number of articles on both of these topics, but to date there appear to be no articles available specifically on *Indigenous students with a disability* in a higher education setting.

Gething (1995) in a case study of Australian Aboriginal people with disabilities reports on "… consultations held with Aboriginal people with disabilities, their families, community elders and carers during a four-day field trip to a remote district of New South Wales". (p. 77) Findings indicated that "… members of remote Aboriginal communities who have a disability often experience a triple disadvantage as a result of having a disability, being Aboriginal, and residing far from an urban centre" (p. 77) and the services it can provide. She points out that that "it seems likely that the proportion of the Aboriginal population which has a disability is higher than the 18 per cent cited for the general population by the Australian Bureau of Statistics (1993)" (p.78). She says that communities have so many other issues to attend to that disability is low on the list of priorities (p. 78). Also, many Indigenous people would not regard themselves as having a disability, however, they are labelled as such by service providers (p. 78).

Gething identifies four issues that make it difficult for the subjects of her research to access services. Firstly, the family is involved in the care and decision-making about a member with a disability, and any service which attempts to isolate the person from his or her family is violating a basic value where communities emphasise the group over the individual. Secondly, because of Indigenous people's experience of past policies and practices, there is suspicion, low levels of trust and feelings of powerlessness, and as a result, they may not feel happy about asking for help outside their culture (p. 79). Thirdly, Aboriginal people shun labels "and [disability] is rarely seen as a separate issue, but is perceived as part of problems which are widespread and accepted as part of the life cycle. Only highly visible conditions such as severe mobility impairment, strokes, spinal cord injury and amputations are regarded as 'disabilities'" (p. 81). Lastly, another issue for accessing services was the inappropriateness of conventional forms of information dissemination such as brochures and letters. Word of mouth was perceived to be the most successful method of disseminating information (p. 83). Gething concludes that Aboriginal people with disabilities tend to underutilise services and that "urgent attention is required to making services sensitive to…cultural and social needs" (p. 85) and therefore there is an urgent need to review models of service delivery.

Smith, Carroll & Elkins (2000) report on the results of a 1996 survey of university outreach, transition and orientation programs to attract potential students with learning disabilities and assist them in adjusting to study in higher education. They found that while most universities offer a comprehensive range of support to students with learning disabilities through generic and disability services, approaches to the documentation of diagnostic assessment and the provision of support are variable, and raise issues of equity which are of concern to support staff. Anecdotal evidence suggests that prospective students may avoid early disclosure of their disabilities as they mistakenly fear this may affect their chances of being offered a university place (p. 29). According to their research, assignment editing assistance or alternative assignment formats were only obtainable in about half of the universities surveyed, and they predicted that the decreasing costs and improvements in voice recognition, grammar check, and text to voice software should enable greater independence by students with learning disabilities in producing and proof-reading assignments and reports (p. 30). Comments from some respondents indicated that the provision of accommodations and support was closely related to what was requested and

that other accommodations and support could be made available if they were requested and the need was documented. According to the authors "This highlights the importance of educating both the students and the generic and specialist support staff working with them (who come from a broad range of backgrounds and who have varied amounts of experience with, and interest in students with learning disabilities) about the many aspects of learning disabilities which may impact on tertiary study and about the broad array of strategies which may compensate for particular problems" (p. 30).

In Morgan's 2001 study of 38 current and former Indigenous students at Flinders University, Adelaide, he examined the factors which influenced their ability to study at university and found that Indigenous support services are perceived by students as enabling factors in their tertiary studies; younger students are more likely to discuss their tertiary progress with their peers rather than teaching or support staff (unlike other students); and female and part-time students believe they would perform better if they had greater domestic support. Also, the lower the grade point average the greater the perception of their likelihood of dropping out and those students who consider dropping out of tertiary studies are more likely to do so. The fact that Indigenous students under the age of 21 tended to prefer advice from their peers when considering dropping out of university was problematic as they were generally less motivated to begin with than mature age students who had some work experience. It follows that building Indigenous students' self-esteem "would appear to be a crucial issue for younger students who are less likely to raise their concerns with Indigenous support staff" (p. 236).

A longitudinal study of learning for a group of Indigenous Australian university students was conducted by Boulton-Lewis et al. (2004). The learning strategies of 15 Indigenous students were tracked for three years in three universities. All of the students reported using highly repetitive strategies to learn in that "they did not vary their way of learning, reading or writing in the beginning of their studies and less than half of them did so at the end of three years" (p. 91). The authors argue that encountering variation in ways of learning is a prerequisite for the development of powerful ways of learning and studying. These students had been granted special entry and start with a disadvantage due to their limited prior knowledge so they needed strong support which was available to a certain extent. But the authors believe that the students would have had a more enjoyable and successful experience had they been helped more to develop their strategies for learning (p. 109).

Adermann and Campbell (2007) examines what is currently known about Indigenous concepts of "wellness" and then looks at anxiety provoking stressors for Indigenous youth and cultural strengths which may ameliorate these. They quote research showing that anxiety is linked to depression and this is a significant issue for Indigenous youth given that their suicide rates are disproportionately higher than for non-Indigenous youth. Suicide risk factors mentioned specific to Aboriginal populations have been found to be a disruption, forceful removal, substance abuse, social isolation, and cultural identity and racism (p. 75). While anxiety is an increasing mental health problem for young people generally little is known about the incidence of excessive anxiety in Indigenous youth.

Mental health is defined by the World Health Organization (1999, p. 1) as "a state of social and emotional well-being that enables people to undertake productive activities, experience meaningful interpersonal relationships, adapt to change and cope with adversity". An Indigenous conceptualisation of mental health on the other hand is holistic containing both cultural and spiritual elements. "Wellness" consists of physical, mental, cultural and spiritual aspects of a person and illness was likely to occur if one element was compromised e.g. time spent away from homelands weakened the spirit which was detrimental to mental health. Protective factors, though, have been found to come into play for youth living in homes with high household occupancy levels and carers being the original parents, participation in organised sport, and in extremely isolated communities following traditional culture and ways of life.

They conclude with the observation that an understanding of Indigenous mental health, particularly excessive anxiety needs to be shared. Education systems have a significant role to play in the social support of students dealing with mental health issues and addressing these issues can have a positive impact on learning and on life outcomes.

Page and Asmar, in their 2008 study, point out that Indigenous students often arrive in academia via non-traditional pathways with fewer formal qualifications than their non-Indigenous peers. They may be "mature age students" which in turn means that they have family and job responsibilities. Consequently, teaching staff spend considerable time and effort supporting their Indigenous students' learning experiences both in and out of the classroom and that these informal support roles have been underreported and may not be visible, or recognised. Another issue is that having access to a critical mass of staff from the same cultural background is seen as crucial and the lack of Indigenous university staff is a serious issue for the retention and success of Indigenous students (p. 109). They found that students often regard Indigenous academics as a legitimate and accessible source of help but the complex set of student demands is being met by a very small cohort of staff, which can impact negatively on their own ability to complete postgraduate qualifications or publish.

In a national report on *The first year experiences of Indigenous students at Australian universities* (2009) carried out by the David Unaipon College of Indigenous Education and Research, University of South Australia, the researchers sought to obtain views and issues from metropolitan and rural and remote Indigenous first year students participating in higher education. Qualitative data was gathered through focus groups from the twelve institutions. They found significant differences between regional and remote students with those living away from home being twice as likely to consider dropping out of university. There was a strong preference by Indigenous students to use Indigenous specific services in preference to mainstream university student services (p. 42), and the staff were often perceived as role models. Students requested a greater Indigenous staff presence on campus to ensure their cultural safety and this extended right across Information and communications technology, counselling, mentoring, orientation programs, accommodation, childcare, social activities and connection to the local Indigenous community. First year student participants reported that strong connections with the community enhanced their feelings of cultural safety and their decision to continue with their studies. Sixty per cent of respondents identified the importance of friendships on campus as a deciding factor in their decisions to continue. However, personal and family issues were contributing factors to student stress and to decisions not to continue with their studies.

Trudgett (2010) makes the point that Indigenous Australians participate in higher education at less than half the rate of non-Indigenous Australians and for parity to be achieved at postgraduate level she claims that the number of Indigenous Australians enrolling in postgraduate studies needs to triple and the completions to increase by 600 per cent (p. 352). In response to this disparity, Indigenous units were established from the early eighties onwards and are now commonplace in Australian universities with their roles and responsibilities varying from one unit to the next. Many Indigenous students were dissatisfied with the support services they experienced within these Indigenous Units and within the university more generally with more than a third of students in a 1996 study reporting that university staff displayed poor or negative attitudes and half of the students had not felt welcome at the university. She suggests that at least one underlying reason for this is the possibility that Indigenous Australians may feel a greater sense of cultural safety when surrounded by Indigenous Australians. However a problem that emerges is that these administrative staff members are providing academic advice without academic qualifications themselves. She recommends that "those personnel staffing Indigenous units have undergone academic journeys that reflect a level of candidature similar to the students" (p. 351).

Summary and discussion

Indigenous students in higher education are a diverse group consisting of young students, mature age females and part-time students from rural and remote areas and from urban centres. Because of low levels of trust for well-documented historical reasons, students are likely to avoid early disclosure of a disability and avoid mainstream services. There was a strong preference by Indigenous students to use Indigenous specific services in preference to mainstream university student services for reasons of cultural safety. Yet Indigenous support units were not always able to provide the support they needed particularly in regard to academic advice and staff were not sufficiently resourced to offer the extra support that students required. Building students' self-esteem was a particularly important issue for younger students who were more likely to heed advice from their peers than Indigenous support staff. Another major issue that emerges from the literature is that Indigenous people shun labels and hence the current medical model of disability is incompatible with Indigenous people's understanding of health.

Chapter 2: Background to the design of the courses for delivery on the hand-held devices

When developing the courses, the team was very conscious of the need to employ the principles of cultural safety and universal design to ensure that Indigenous students were empowered in their new learning environment.

This chapter, written by Sharon Kerr, provides a background of these two key concepts and concludes with a section on online learning spaces citing the six core principles developed by Kerr and Baker (2013), closely followed by the team in translating the curriculum for use on the hand-held devices.

Cultural safety

The literature is quite extensive on the issue of the importance of familiarity of space in relation to engagement with learning for Indigenous students. Munns et al., (2008) in their article *To free the spirit? Motivation and engagement of Indigenous students*, pay particular attention to the issue of the learning space and the power dynamics within it. From the students they interviewed they identified the importance of the learning space generating intrinsic rewards and motivation. Sadly, with the interviews that were conducted with Indigenous students for the purpose of the study, the majority of respondents "saw their classrooms as predictable and routine. "Few could name classroom experiences that excited or interested them – there was little surprise or wonder" (Munns et al.,2008, p. 103). This highly structured learning environment, they continue, is at odds with ways that Indigenous students operate culturally outside of the classroom. In their conclusions about ways forward, they highlight the importance for learning spaces to allow "a focus on autonomy and self-regulation with frequent opportunities for all students to make decisions about their learning" and "provide frequent opportunities for students to reflect on and share ideas about their learning" (Munns et al., 2008, p. 105).

Bennet and Lancaster (2012), in their article *Improving reading in culturally situated contexts*, emphasise the importance of finding a naturalistic informal learning space in which both students and parents would feel welcome and relaxed. In their study, site selection was the cornerstone for the entire program. It was important to provide an environment that did not carry with it the traditional associations of classrooms. Students and community alike, "felt like they had a level of power and authority" in that learning space (Bennet and Lancaster, 2012, p. 210). When analysing the results of the program held with 24 children and their families, they attributed much of the success of the program to the learning space facilitating the building of relationships between children, family and

teachers. All parties felt relaxed and not intimidated by the environment. They concluded that "the semi-formal nature of this site, away from the traditional classroom and the voluntary nature of student and family involvement in the project meant that pre-service teachers needed to develop proactive relationship skills with the students and the parents in order to encourage further attendance and academic learning". This issue of power in traditional learning spaces as an inhibitor to learning for Indigenous students is of note when considering optimum learning spaces for all students.

Rhonda Coopes, a prominent Aboriginal scholar has written extensively on the importance of creating a culturally safe learning environment for Indigenous students. Coopes ascertains that a culturally unsafe environment is an obstacle to engagement and participation of Indigenous students in learning (Coopes, 2007; 2009). The concept of cultural safety was first developed by the Nursing Council of New Zealand in the training of their nurses to respond to Indigenous patients in a way that would enhance trust, communication and positive health outcomes. In training their nurses they identified three major components that were necessary to ensure cultural safety for Maori patients. These components were reflection, recognition and respect. The emphasis here is for the nurses to prepare themselves for treating the patient through working through these three stages. Not for the patient to prepare themselves for the system so that are in a state to accept appropriate medical treatment (Nursing Council of New Zealand, 2005). So in a comparison with education, rather than preparing students to learn how to learn and engage with the system, we would be having the teaching staff prepare themselves for the interactions with the students.

With cultural safety, the emphasis is not on the patient or student to become empowered or to change in such a way that they will be receptive to the care and education afforded to them, but rather the emphasis is on the practitioner to prepare themselves to be open and caring in their approach to service.

Reflection

With reflection, the first of the three components, the practitioner is encouraged to reflect on their own history and sense of knowing and being. A practitioner needs to reflect on their own heritage, relationships, opportunities, in short what has made them the person they are. Further to this, they need to reflect on the experiences of the Indigenous people from where they grew up and where they are serving. By reflecting in this manner practitioners can develop an understanding of the impact that their own cultural background has had on their own lives and understand how they culturally present to other people (Nursing Council of New Zealand, 2009: p. 60); in the case of New Zealand nurses, when serving Maori patients, in the instance of Australian teachers, when teaching Indigenous students.

This process of reflection provides teachers with a framework from which to understand students and their communities and develop strategies to enhance effective communication and the building of relationships. It also helps them grow as individuals by coming to grips with their own heritage. Further teachers going through this process of reflection are being realigned as equal players in the teacher–student relationship. A teacher who is practising the principle of reflection, by definition is opening themselves up to their students. In a case study conducted by the University of Western Australia with a small class of 25 Indigenous and non-Indigenous students studying Aboriginal history, cultural safety was practised by the teachers. This study provides evidence of the delight of the students in response to the openness of their teachers and their accessibility as fellow learners (Brown, 2010).

One student commented:

> "it was kind of refreshing to see a professor out in jeans and a t-shirt that says "Hugs, not drugs" … It was good to see that he didn't take himself too seriously" (Brown, 2010, p. 19).

Recognition

A further area of tension in relation to reflecting on one's own culture and the place it plays in determining ones identity is that dominant cultures often dictate that there is only one truth, which places it and its members in a mindset of superiority.

Indigenous cultures by contrast have long been recognised as being open to other cultures and other people's stories. Philip Jones in a statement to the Hindmarsh Island Bridge Royal Commission stated:

> "Ngarrindjeri people have shown that they are open not only to their own particular history and cultural influences, but to those of the wider community" (Sutton, 2010, p. 74).

Dodson (2011) addresses the second component of recognition in a lecture given at Parliament House, Canberra, titled "Constitutional Recognition of Indigenous Australians". In discussing a mooted referendum on this topic, he states that adding a new section to the Constitution (105b) "would allow the federal government and the states and territories to enter agreements with representatives of Aboriginal and Torres Strait Islander peoples, primarily—but not exclusively—to deal with the unfinished business which is around status, identity, citizenship, recognition and finally to give us some time to discuss things". (p. 17)

This sense of "unfinished business" between Indigenous Australians and the dominant European culture is at the heart of the recognition issue, becoming particularly relevant to the way young Indigenous Australians might need to deal with such issues as status, recognition and identity when entering tertiary education.

If a teacher is not open in a similar way with their reflection, an unwanted power imbalance may result. The Nursing Council of New Zealand has listed in their areas for reflection to include personal attitudes to disability, sexual orientation, occupation and socio-economic status, age and gender (Nursing Council of New Zealand, 2009, p. 9).

By teachers and lecturers undertaking this type of focused reflection they are in a stronger position to recognise the history of their students and accord them respect. Emmanuel O'Grady et al., in their study with pre-service teachers at a university in Ireland on the importance of respect in teaching and learning, confirmed that students in turn accorded teachers respect not solely based on their knowledge of subject material but on the "willingness for the teacher to convey 'interpersonal respect'" (O'Grady, 2011, p. 516).

Cultural safety is not cultural awareness or cultural sensitivity, where there is a one way acknowledgement and acceptance of another's culture as a separate curiosity, but rather a higher order outcome that "enables safe service to be defined by those who use the service" (Nursing Council of New Zealand, 2009, p. 5, Fig.3). In other words, in a culturally safe teaching environment the power needs to be with the students. If students have the knowledge that they, their families and communities are respected by the teaching staff, they will be empowered to participate and learn.

Respect

Kiara Rahman highlights why this attitude of respect is of utmost importance in a learning environment for Indigenous students stating that "most of the learning rules or guidelines reflect the 'white' dominant culture values and practices, and that it is generally those who don't have the cultural match-ups that schooling requires for success, such as Indigenous and minority students, who face the most educational disadvantage" (Rahman, 2012, p. 1). She goes on to discuss and provide an analysis of the hidden curriculum whereby "students meet the expectations of their teachers, in relation to their learning" (Rahman, 2012, p. 4). Neil Harrison in his work on teaching and learning in Indigenous education also argues that "Most kids want to be understood and they want the things they recognize in themselves to be recognized by others" (Harrison, 2008, p. 113).

Similarly, from a North American perspective Fryberg et al., (2013) establish that cultural safety is crucial for Indigenous student engagement and conclude that “Aboriginal students come to school with their own cultural framework for getting an education and their own understandings of what it means to be a “good” person, but academic environments also provide cues that the students' framework fits or, as is too often the case for Aboriginal students, does not fit. As Aboriginal communities work to augment the educational experiences of their students and to promote long-term growth and achievement, creating schools that promote and foster academic attainment may involve legitimating a variety of viable ways of being”.

While the concept of cultural safety is solidly supported, the concept of familiarity of space and culturally appropriate learning spaces is not without its critics. Terry Moore (2011) in his paper based on his doctoral thesis *Policy Dynamism: The Case of Aboriginal Australian Education* highlights that Aboriginal culture is not a unitary national pre-colonisation culture and views the “national imagined Aboriginal culture is increasingly an artefact of the relationship with settler – Australia”. His view is that “many Aboriginal students come to believe that their Aboriginality inheres in practical interests, environmental knowledge, connection to kin, oral learning style and ‘emotional straightforwardness’ (Moore, 2011, p. 155).

Much of the work of Noel Pearson would support this and his approach to the Cape York Aboriginal Australian Academy. In his paper *Radical Hope: Education and Equality in Australia,* Pearson’s (2009) focus is very much on what happens in the classroom and parents, teachers and community alike having high standards and high expectations for Indigenous students. He cites the MULTILIT program as an example of excellence in engaging students. Again however, the emphasis is on the quality of the teaching, and the pedagogy for education delivery, not the built physical environment.

Tess Lea (2011) in interviewing 48 family and community members from two country towns in the North of Australia over two years established that contrary to much of the current dialogue, Indigenous parents and community members did not find schools as western institutions and learning spaces a barrier to student engagement and learning. She states “Hence we had Indigenous parents telling us repeatedly that they did not feel uneasy about coming to the schools, while educators repeatedly nominated ‘parent discomfort’ as a key barrier” (Lea, 2011, p. 280). She goes on to explain that it was not the physical environment of the schools and institutions that the parents and community members had problems with, but rather the power relationships and exclusionary behaviour that was evident within the institutions. Furthermore, that issues associated with poverty e.g. not having a vehicle to get the children to school, was mentioned as a barrier to engagement. In relation to the built environment and learning spaces, Lea reports that “the idea that the schools as physical structures were themselves barriers was never mentioned by our Indigenous informants. Even when asked directly, the idea that the layout, portals and look of the school would prevent them from approaching anyone was simply ludicrous. In our data from parents, there was no evidence to suggest that they fear the school setting, are intimidated about going to the school or by physically being there” (Lea, 2011, p. 270).

Aspects of universal design

Universal design in learning

Universal Design in learning environments and curriculum is described by the National Center on Universal Design for Learning (a program run from the Center for Applied Special Technology, Wakefield, Massachusetts) as “A framework that addresses the primary barrier to fostering expert learners within instructional environments: inflexible, “one-size-fits-all” curricula”.

In the Universal Design for Learning Guidelines version 2, a framework is presented based on three principles of student engagement with learning environments which address adopting a flexible attitude to how learning and teaching is presented, how students are required to respond to the learning experience and how they choose to interact with others in the learning environment. This approach is based on recognising and valuing diversity in students and “encourages creating flexible designs from the start that have customizable options, which allow all learners to progress from where they are and not where we would have imagined them to be” (Universal Design for Learning Guidelines, 2011).

Ouellett, M. (2004), Pliner, (2001) and Silver et al., (1998) provide further support to the concept that curriculum designed with the needs of students with disability in mind can introduce flexibility that will enhance the learning experience for all students.

Online learning spaces

Scardamalia and Bereiter (2003) in their work on knowledge building environments (KBE’s) in the online learning space, examine what transforms an online learning tool into a learning environment. In their study they focus on knowledge creation being a human and creative activity and contend that the effectiveness of a KBE needs to be judged by the knowledge generated in that particular environment. Discourse between students and time spent online is itself not enough to validate the effectiveness of the KBE. Intrinsic to the concept of an effective KBE is understanding that “social, cultural and cognitive dynamics inform the design of optimum KBE’s” and that “knowledge advancement is fundamentally a socio-cultural process, enhanced by cultures of innovation” (p. 3). This may be of particular importance when designing a KBE to be used by a broad range of students, including those from Indigenous backgrounds. In order for a KBE to be effective and true to its name, it needs to satisfy the requirements of “flexibility consistent with the emergent goals of knowledge creation” (p.7).

In Jorgensen and Lowrie’s (2011) view, online learning and using digital games provide a new opportunity to develop a new learning space for Aboriginal students in the light of a failing school culture and resistance by Aboriginal cultures to traditional learning spaces. They view digital media as a hook for learning and maintain that games environments provide a way of developing a third space for learning. They state: “Our goal was to create a third space that would provide both a bridge to formal school knowledge while scaffolding students to enable them to undertake boundary crossings successfully. By creating a space where students could make connections between their personal interests and with concepts within school culture with that of their own interests, we have shown that there are many benefits for education provision” (Jorgensen & Lowrie, 2011, p. 141).

Inclusive design

In their article *Six practical principles for inclusive curriculum design*, Kerr and Baker (2013) provide concrete guidance for teaching in online learning spaces using Universal Design curriculum principles that will enable students who are reliant on assistive technologies, full access to the learning experience. Assistive technologies have traditionally been used by students with sensory or cognitive disabilities, however, with the appearance of hand-held devices such as the iPad, the general population is able to use the inbuilt assistive technologies in these devices to access information and knowledge.

These six principles encourage lecturers to:

1. ensure that inherent requirements for the online course are clearly articulated and available to students prior to enrolment. This allows students to select courses according to their abilities.
2. regularly evaluate the course to check that additions that may have been made by other staff or students haven't reduced the accessibility of the course. If issues have arisen, then it is important to modify the course accordingly.
3. check that all of the learning materials and technologies to be used in the course are fully accessible. Background is given on the expense involved if learning materials and solutions need to be converted for individual students, together with the claim that: "inclusive curriculum design from the start is good not only from an equity perspective but also makes good business sense". (Kerr & Baker, 2013, p. 244)
4. use plain English to facilitate optimum communication.
5. adopt a flexible and inclusive attitude with regard to making alternative arrangements as required by students due to disability.
6. adopt an attitude of flexibility (in designing online courses) with regard to timelines, assessment tasks and course requirements. In doing so, a lecturer is "being student-centred, flexible and aware of other priorities or commitments that the student may have" (Kerr & Baker, 2013, p. 247).

Kerr and Bainbridge (2011) have developed two online tools; *MQAS Orange* an online development tool, and *MQAS Green* an online audit tool, that are built on these six principles, and show teaching staff and online developers the process of designing online curriculum using Universal Design principles. They emphasise the importance of putting oneself in the student's position and creating a learning environment accordingly. Both tools introduce recurring themes of flexibility, diversity, alternatives and choice in the way students engage with the learning experience and assessment tasks.

Nicholls and Philips (2012) look at what can be taken from the traditional drama classroom and translated to the online learning environment. They start from the premise that "The drama workshop space in its physical and virtual forms is seen as a model for classrooms in other disciplines, where dynamic, creative and collaborative spaces are required" (Nicholls & Phillips, 2012, p. 583). They highlight how a traditional drama learning space is actually an empty room in which students can access props and resources required in both solo and collaborative learning.

Attention is given to the need for the online learning space to be aesthetically and pedagogically well-integrated in order for students to be engaged with their learning. In order to achieve this they advocate provision of a wide range of media including film, audio, images, verbal texts, and traditional texts. This provides students with flexibility to engage with the learning environment according to their individual preferences and creativity. Blog spaces they viewed as important in providing students a space for their personal voice and field trips using facilities such as Second Life enabled students to project themselves into the learning space. They conclude, "By designing spaces that aim to capture the imagination and promote creative and critical thinking, independence and experiential collaborative learning, it is possible to heighten student engagement" (Nicholls & Phillip, 2012, p. 602).

All of the insights and studies mentioned above have contributed in some way to design of the learning materials included in the eBook developed for this project. We have tried to come up with approaches that are inherently inclusive and provide students with equitable access to the learning materials that is independent of requirements such as high-speed web access or the use of specialised software or training.

Chapter 3: How we went about the project and achieved the outcomes

As outlined in the previous two chapters, Indigenous communities view disability differently to mainstream higher education providers. This difference has resulted in a disconnect between the support traditionally offered to students in universities across Australia and the needs of Indigenous students with a disability. In preliminary studies, the project team established that Indigenous students generally did not wish to engage with the bureaucracy surrounding provision of support or perceived discrimination by the adoption of a deficit label of disability.

Meeting the challenges

In response to this, the project team met these challenges to customise the learning experience for three diverse groups of Indigenous students who participated in this trial by ensuring:

- cultural safety for the students and Indigenous staff
- Universal Design of curriculum – so that students were not placed in the position of needing to declare disability
- equity of access to the technology for all students and staff to avoid disadvantage
- customised training and support in the use of the technologies and access to the curriculum content
- that all materials were designed to be available without access to the internet
- that the eBook constituted a totally self-contained learning experience that could be engaged with from remote communities.

Extensive consultation was undertaken with the development of each eBook. In each instance the unit convenor worked closely with the research team to ensure that all considerations regarding the integrity of the curriculum were preserved. This process of consultation took approximately three weeks for each course. Staff had input at all levels including visuals, layout, language use and inclusion of reading materials. Special permission was granted by publishers of the textbooks to waiver the copyright restrictions of their materials and these materials were reformatted by the staff of MQAS to ensure accessibility by students.

Video summary of the project and its outcomes

A discussion of how the eBooks were developed and used can be viewed in the summary video to this report, available at:

http://staff.mq.edu.au/teaching/projects/indigenous_ebooks/

Technology use in the design of the eBooks

A deliberate strategy used to develop the eBooks for this project was to use standard web-based software that would allow for stand-alone or web-based interaction, with minimal maintenance. For this reason, all of the components that make up the pages of the eBook are written using standard HTML. The actual page editing software used was Adobe Dreamweaver. Once a component was coded it was downloaded onto each tablet so that students did not require internet access.

The tablet-based version of the Batchelor Institute unit PTS002 was created in the form of a website that was offline and housed locally on the computer tablets. This format was chosen as it was the most efficient way to collate and deliver content and learning experiences for the students. It also made it easy to embed web links that students could access if and when they had internet access. As students were already familiar with internet use, this format was relatively intuitive and helped connect the offline to the online content. Having the content in a web format offline also made it easier to access using the inbuilt assistive technologies.

Chapter 4: Outcomes for the five project deliverables

Deliverable 1:

Develop two eBooks for use on handheld devices for students studying units with ACIKE at Charles Darwin University and Batchelor Institute of Indigenous Tertiary Education and at Warawara at Macquarie University.

Outcome:
The first eBook was developed for both Charles Darwin University and Batchelor Institute students that presents a wholly standalone version of the introductory unit *PTS002: Strength and Success*. The handheld devices used for this eBook were Samsung Series 7 Slate tablets.

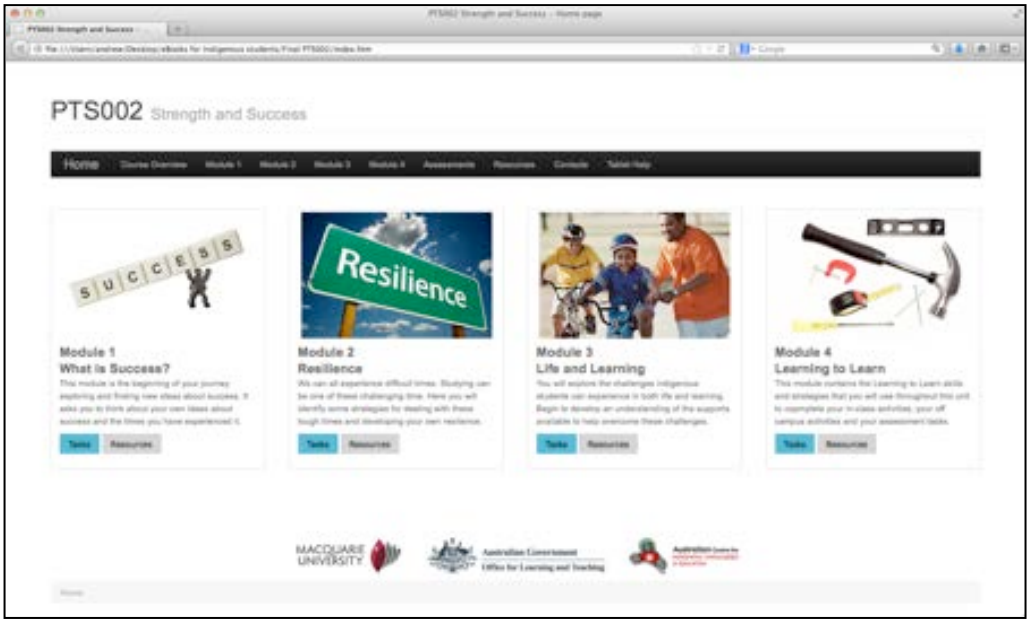

Figure 1 Screenshot of PTS002 Homepage

This unit introduces new students in tertiary studies to ideas that can support their future success at university through four modules:

Module 1: What is Success?
This module encourages students to explore ideas about success.

Module 2: Resilience
This module teaches strategies for dealing with problems that arise during study.

Module 3: Life and Learning
This module identifies the challenges experienced by Indigenous students and the supports available to deal with them.

Module 4: Learning to Learn
This module provides students with lifelong skills and strategies that can assist them when completing assessment tasks.

Each module contains a list of tasks and resources such as text, videos, and images that can assist completion of the module tasks.

The unit was taught in parallel at Charles Darwin University and the Batchelor Institute.

Similarly, a second eBook was developed for students enrolled with Warawara at Macquarie University in an early childhood unit This eBook was developed using the same universal design principles, but delivered on different handheld devices, (Apple iPads), which have built-in accessibility features that can be accessed through a highly intuitive interface.

The final hardware platform for delivery of the units varied across the institutions. At Macquarie University, the early childhood eBook content was loaded onto 15 Apple iPads that students could take home and use for the duration of the course. At Charles Darwin University and at the Batchelor Institute, the Success and Strength eBook material was loaded onto 24 Samsung Series 7 Slate tablets donated to the project by Microsoft.

Accessibility Issues

None of the students who participated in the trial had a declared disability, although as explained in Chapter 1, this provides no evidence one way or the other on whether actual disabilities were present. The adoption of Universal Design principles at the outset allowed the project team to proceed knowing that any materials produced would have the widest acceptance possible by future student users. Likewise, the choice of delivery hardware platforms (Apple iPad and Samsung tablet devices) was based on the built-in accessibility features included in those devices.

All learning materials included on the devices were designed to be accessible in offline mode. That is, apart from deliberate choices by students to initiate live web-browsing, all of the learning materials could be accessed without an internet connection and in a wholly standalone mode. Thus, course related study could proceed in areas with poor or non-existent internet connections, as may be the case in some remote Indigenous communities.

Deliverable 2:

Establish a project webpage.

Outcome:
A project webpage was originally established at <www.mqas.org> containing a blog titled MQAS News with details of the OLT eBooks project. The MQAS website was hosted by an external server organization. With the disbandment of MQAS, access to the website was discontinued. An archive file containing a snapshot of the MQAS News blog is available from a web archive facility, and can be viewed at <archive.is/7KGc1> . It also is reproduced as **Appendix A**.

The Learning and Teaching Centre (LTC) at Macquarie University has created an “Indigenous eBooks Project” page on its publically available website that contains details of the project, its outcomes, together with a link to the video produced for that purpose. The project page can be accessed at:
http://staff.mq.edu.au/teaching/projects/indigenous_ebooks/

Figure 2. Staff/Student Training Session with the Samsung Tablets and Dedicated Software

Deliverable 3:

Develop and conduct training sessions for staff and students on the use of the technologies.

Outcome:

Staff and student training sessions were conducted at all three institutions involved in the eBooks project by members of the project team (See Figure 2, above). Training sessions were designed to ascertain student facility in using the hardware and software, and to provide support for navigation issues and engagement with the eBook content. The project team subsequently observed student use of the eBook hardware devices and the included software in a follow-up session. Most of the students observed quickly developed a facility for using the devices and the contained software, including the eBooks specifically designed for use in the trial.

The three trainers involved in delivery of the training sessions all reported that the students were keen to learn how to use the devices for both formal study and recreational uses, and that by the end of the session most students were comfortable navigating the interface. This result was not unexpected, given the care that went into designing an interface that was intuitive and highly accessible.

Deliverable 4:

Implement the eBooks at participating institutions, and analyse data obtained from hand-held devices and feedback from students and staff.

Outcome:

As reported earlier, the eBook programs and devices (Samsung Slate Tablets and Apple iPads) were distributed to Indigenous students attending courses at the two participating institutions: Macquarie University, and the Batchelor Institute (Alice Springs and Darwin campuses). Having received training, students were encouraged to use the devices with the included eBook software as a source of course content supplementing the face-to-face component of their courses.

Analysis of the usage data was subject to some constraints due to the nature of the ethics approval obtained for the eBooks study. As the approval was not obtained specifically for students at either of the Batchelor Institute campuses, only the students with Warawara at Macquarie University were surveyed, including eight of the course participants. Teaching staff from all three institutions provided written feedback on the implementation of the eBooks program. Surveys and feedback are discussed in the Feedback and Findings section below.

Deliverable 5:

Disseminate outcomes via journal articles and conference presentations.

Outcome:
In discussion with the OLT, it was agreed that, in lieu of journal articles and conference presentations, outcomes for this project should be discussed through the medium of a short video, accessible from a Project page on the LTC's main website (see Deliverable 2). The video would support dissemination of project findings into the future.

A six-minute video was produced to give an overview of the project, provide examples of the developed programs in use at the three institutions, and draw conclusions about the impact of the program on learning for Indigenous tertiary students. In the video, the three MQAS project members, Sharon Kerr, Roslyn Sackley and Andrew Lovell-Simons provided insights into the original drivers of the project, their impressions of how the devices and eBooks were received by the student users, and what future directions to take in applying learning technologies to Indigenous education.

The video can be viewed on the LTC's online Project page, located at:
http://staff.mq.edu.au/teaching/projects/indigenous_ebooks/

Information for Key Stakeholders
The project identified the following key stakeholders in provision of services to students with disabilities, who might benefit from the findings included in this report. They include:

- The Australian Tertiary Education Network on Disability (http://www.atend.com.au)
- Vision Australia (http://www.visionaustralia.org.au), and
- The Australian Federation of Disability Organisations (http://www.afdo.org.au)

Each of the above organisations has been contacted about this report with a view to disseminating the findings to key organisations whose members might benefit as a result.

Chapter 5: Feedback and findings

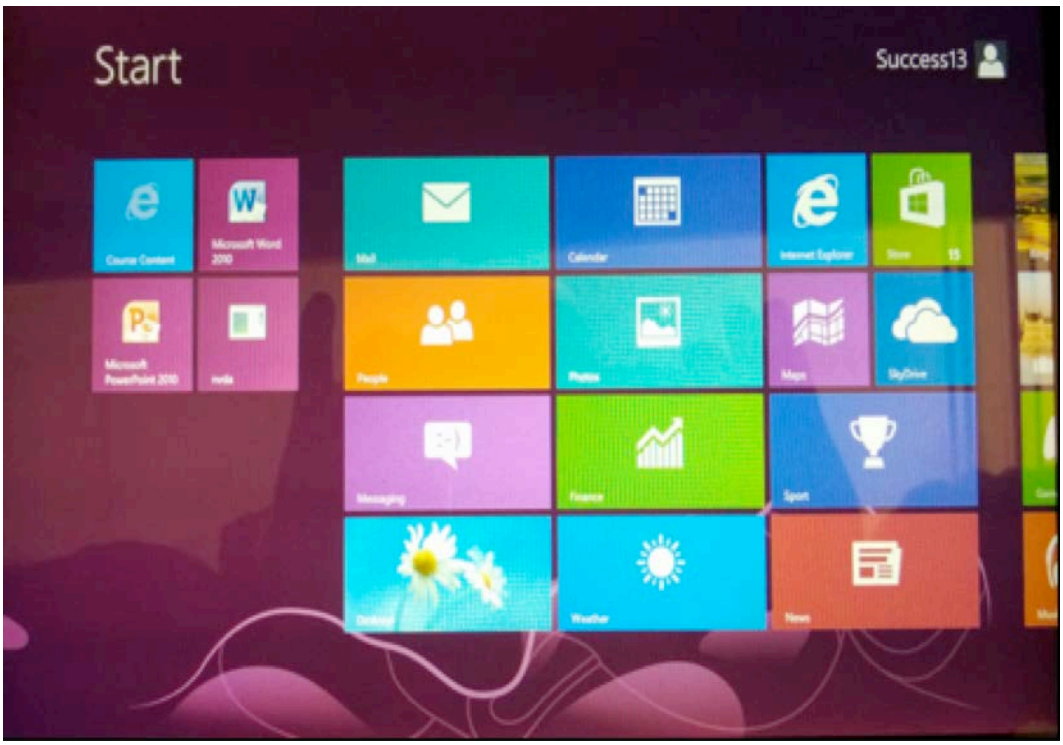

Figure 3. Screenshot of the homepage of the ASUS tablet device

Summary of observations of students by teachers and MQAS staff over two days (Batchelor Institute):

- Students were enthusiastic about using the tablets
- There was a range of expertise from novice to expert
- The use of tablets enhanced group work, as experienced users shared their knowledge with inexperienced users
- Students' level of skill using the tablets increased very quickly with familiarity
- There was a marked increase in confidence after using the tablets for two days
- Continuity increased as students could access all their learning materials and the Internet whilst still working in groups in the classroom
- Students' IT skills increased over the two days of observation. They made use of the Microsoft Office Suite of products for their project work.

Given the limited time available for MQAS staff to observe use of the tablet devices by participating students, there are some limitations to the conclusions that can be drawn about the impact of this use on Indigenous education overall. Many of the summary comments listed above relate to student responses to the use of the supplied devices, rather than to observations of the impact on their learning. Significantly, however, the second point mentions that the use of the tablets impacted on knowledge sharing and group work in a positive way. This may indicate the true value of the exercise, in that the project's use of a learning technology for a specific purpose provided a setting for an enhanced learning experience that went beyond the course content.

Figure 4. Students at Charles Darwin University using the eBook software on Samsung tablet devices

Summary of Student Survey responses (Warawara at Macquarie University)

- All eight students who participated in the survey were female
- Four were over forty and three were under 25
- Five were from NSW and two were from Queensland
- Six students found the technology helpful
- Seven students' families and friends were able to use the iPad
- **All** students used the assistive technology
- Six students found the assistive technology very helpful
- Seven students said there were benefits having their learning materials on the iPad
- Six of the seven students commented on the portability of having ALL their readings in the one place
- Seven students said they would like other courses to be available on the iPad.

Summary of Unit Convenor Survey responses

- Two convenors stated that they had more freedom in their teaching as students had all their unit material with them on the tablet and did not need to go to a computer lab to access the Internet
- Two convenors thought the trial impacted on their students learning outcomes in a positive way
- All the convenors thought students appreciated the opportunity to upload additional material to their computer tablets.

Discussion on the impact of the Project on Indigenous Education

In a response to the Bradley Review of Higher Education Report (2008), Behrendt, Larkin, Griew and Kelly (2012) identified two key factors that were critical to the success of Indigenous students in higher education, namely:

- Accessible, flexible delivery modes, and
- Support for students' financial, personal and academic needs (p. 184).

This project addresses the first of these factors by providing an accessible, flexible delivery mode for course content in the two courses that were the subject of the study. Accessibility was addressed in two ways: through the use of universal design principles to ensure equitable access for the widest possible group of users, and through the choice of delivery platforms with user interfaces that had built-in accessibility features. Flexibility was addressed through the provision of an entire course of study and all of the software necessary for actively engaging in the associated activities as wholly self-contained components that did not rely on an internet connection, allowing study to proceed offline. This meant that students had a lot of flexibility in choosing when and where to engage with the course.

Addressing the second factor above; students were given free access to the hardware and software for the length of the course, which meant that they were spared the expense of purchasing their own hardware and software to use when completing their studies. Personal needs were met by ensuring that the learning design used took into account cultural safety issues, and the training was conducted in a supportive and non-judgmental setting. Academic needs were supported by the design of the units themselves, which emphasise the positive aspects of learning at tertiary level, and also facilitate group-learning approaches to education.

Conclusion

We believe that this project has made a positive contribution to the provision of equitable access to education for Indigenous students studying at tertiary level. The use of designed-for-purpose software on standalone devices is a first for education in this specific area and it gives direction to further exploration of ways of using these and other emerging educational technologies for the benefit of Indigenous education in Australia.

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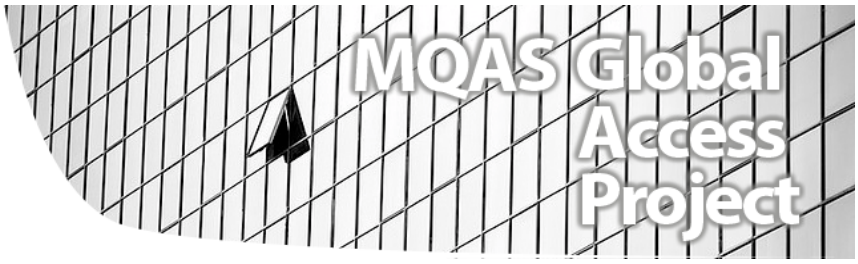
Appendix A: Blog post for Indigenous students eBook trial

Extract from <www.mqas.org> web-page
Archived at: <archive.is/7KGc1>



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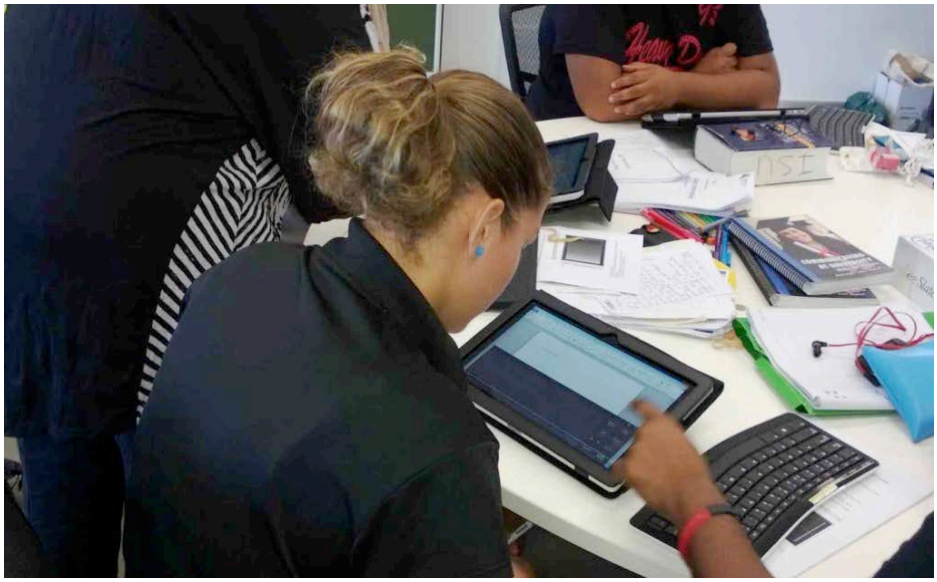
eBooks for Indigenous students trial

Posted on April 11, 2013 by AndrewLS

MQAS has just completed the first stage of a trial to develop learning materials on computer tablets for Indigenous students living in remote communities. The customised eBooks were for the Australian Centre for Indigenous Knowledges (ACIKE) students studying at Charles Darwin University.

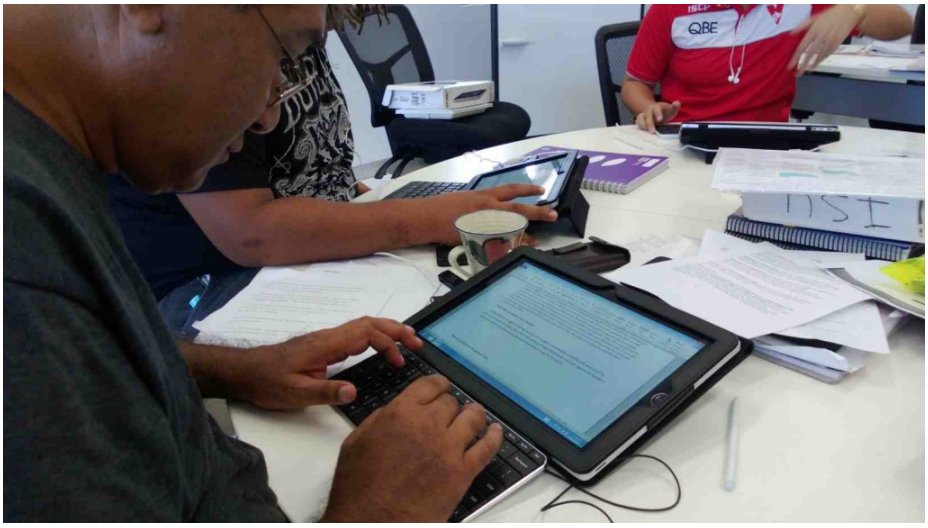


Indigenous student showing her friend how to use Word on the computer tablet

The eBooks were developed using universal design principles, which allow students with sensory or learning disabilities access to learning materials using the tablet's built-in assistive technologies. Thus removing the need for students to identify as having a disability, or seek special assistance.

This project is based on concerns raised to MQAS since 2007, about Indigenous students with disabilities being more hesitant to ask for support or assistance than the general student body.

For the trial, students have all their texts and multi-media materials on one portable device, creating an inclusive learning environment. Students living in rural and remote communities will not be disadvantaged by unreliable or non-existent internet access.



Indigenous student typing up his assignment on the computer tablet, using the portable keyboard

The devices allow students to increase the size of the fonts and images to suit their needs and also listen to any of the course content being read out to them using the text to speech technology. Students can choose to read transcripts of any of the audio recordings and all videos are captioned.

This project is funded by the 'Office for Learning and Teaching' Grant.
MQAS would like to thank Microsoft Australia for their support by donating all the hardware and software, used in the trial, to the Northern Territory Indigenous students.

A group of Indigenous students sitting around a table using the computer tablets

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