

# Indigenous perspectives on integrating learning technologies in a tertiary enabling program

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The Centre for Aboriginal Studies at Curtin University offers an Indigenous Tertiary Enabling Course designed to equip Indigenous students for entry into mainstream university degree programs. While the program is highly regarded, it is argued that opportunities offered by incorporating contemporary learning technologies to allow more effective student engagement can deliver more successful outcomes. With this in mind the Centre has undertaken to introduce the use of tablet devices (iPad) and notebook computers (MacBook Air), which will enable a strategic shift towards a more student-centred, technology, integrated model of student engagement with anticipated enhanced outcomes. The Centre has undertaken to trial the use of online teaching and learning strategies in semester 1, 2014. At this pre-tertiary level, it is anticipated the advantages of a student-centred experience will become evident as the trial moves through the year. This paper describes the current conditions and staff perceptions after the first year of implementation as well as comparing outcomes from the most recent ITEC cohort.

## Context

This project, developed in accordance with *Teaching and Learning: Australian Best Practice* – Curtin’s desired Student Graduate Attributes – takes account of the Review of Higher Education Access and Outcomes for Aboriginal and Torres Strait Islander People. Behrendt et al. (2012, p. ix) note “the Bradley Review (2008) concluded that ‘Australia faces a critical moment in the history of higher education’, where ‘the reach, quality and performance of a nation’s higher education system will be key determinants of its economic and social progress’”. The review goes on to examine “how improving higher education outcomes among Aboriginal and Torres Strait Islander people will contribute to nation building and reduce Indigenous disadvantage” (Behrendt, 2012).

The review further recommends that targets be set for Aboriginal and Torres Strait Islander student enrolments and staff employment in the higher education sector, in accordance to the national parity rate of 2.2% (as at July 2012). They further suggest that universities use the national population parity rate to set their own targets and timeframes. Of particular relevance to this project is their recommendation that “the retention and completion rates by Aboriginal and Torres Strait Islander students [should match] the rates for those of non-Indigenous students across the disciplines, and at each of the levels of study” (Behrendt, 2012).

## Indigenous tertiary enabling course

The Centre for Aboriginal Studies was officially established in 1983, although programs for Aboriginal and Torres Strait Islander people have been operating at Curtin University since the mid-1970s. The Centre is a self-determining, self-managed academic school situated at Curtin University in Bentley, fifteen minutes out of the Perth Central Business District.

The Indigenous Tertiary Enabling Course (ITEC) was first offered in 2001 and aims to further Aboriginal and Torres Strait Islander self-determination and self-management, promote a positive

sense of Indigenous identity, culture and heritage, and increase career potential through degree programs.

The ITEC curriculum integrated with the UniReady Enabling program in semester 1, 2014. UniReady runs a similar program to the ITEC but its student cohort is much larger as the program offers online and internal options to domestic and international students. ITEC students study two of UniReady's core units - Academic Writing and Communications, then elect a further two units from both enabling programs. ITEC elective units include: Introduction to Mathematics, Aboriginal Studies, Humanities Foundations, and Science Foundations. Introduction to Health Science is an additional UniReady elective unit available to ITEC students preparing for entry into the Faculty of Health Science.

This cross-fertilisation is deemed to be working well, as indicated by staff and student feedback at this stage. This new arrangement is the first time ITEC students have an engagement in the UniReady program, and may also become an influencing factor in any shifts we observe.

ITEC students are immersed in the university environment in preparation for undergraduate studies, and offered support, knowledge and skills while promoting a strong sense of Aboriginality which values students' cultural background. On successful completion of this course, students will be eligible for entry to a range of Curtin's degree programs.

The ITEC attracts enrolments of up to 30 students per year – mainly from the Perth Metropolitan area – but as noted above, the dropout rate is high. Many of the reasons given in other research for this high level of withdrawal are associated with family issues, and poor literacy and academic skills, including essay writing, and locating and referencing academic information (Forrest et al., 2014). Staff working in the ITEC suggest similar issues of poor retention statistics. It is predicted that a strategic shift toward a more student-centered, technologically integrated model of student engagement will offer opportunities to encourage a higher retention rate.

Few Indigenous students to date have enrolled in the UniReady course since its inception. However, the current approach to teaching the ITEC curriculum (exposure to larger student cohorts) is proving advantageous. These advantages include:

- ITEC students experience classes with non-Aboriginal students for part of their enabling studies and this prepares students for mainstream undergraduate studies,
- integrating units across both programs provides ITEC students with more unit options and this allows for students to complete specific introductory units for each faculty, and
- shared core units across both programs provide consistency in writing and communication standards.

Upon completion of the ITEC, students are eligible to apply for minimum entry requirement Curtin undergraduate courses, which require an ATAR of 70.00 without pre-requisites. Successful students can also apply to universities outside of Curtin in many disciplines. However, although they are eligible to apply, there is no guarantee of entry at this time.

## **Application for Indigenous students**

Although most students who are currently or have recently undertaken the ITEC at Curtin University reside in the Perth metropolitan conurbation, it cannot be assumed that their educational experience is similar to Western Australian students in general. This is due in some part to a long period of official discrimination, at both federal and state levels, of low socioeconomic conditions and some levels of incarceration at the domestic level – all of which result in initial disadvantage at the pre-tertiary level.

Research from Forrest (2014) indicates that on arrival at the university, Indigenous students require remedial assistance with encountered difficulties specifically relative to the issues of research, referencing and academic language. Again, it must be acknowledged that cultural, family and financial problems also have a major impact on retention levels in most bridging/enabling courses.

The 'Our Children, Our Future' report on Achieving Improved Primary and Secondary Education Outcomes for Indigenous Students (2007) identifies Indigenous student performance and achievement in education as significantly below mainstream numeracy and literacy levels. Numeracy and literacy are recognised as important contributors to school attendance and as key indicators for student performance. The report reinforces the point that the disparities in student learning and performance are identifiable from Year 1 and maintained throughout primary and middle school. Therefore, it is no surprise that the percentage of Indigenous students not meeting the benchmark standards for numeracy, reading and comprehension and writing is significantly higher than that of non-Indigenous students. The report further highlights that Indigenous students are not achieving the national minimum benchmark and this gap is apparent when they reach tertiary education.

At the ITEC level, several initiatives are being implemented to assuage some of the issues presented on enrolment and indeed throughout the course. These include a high level of pastoral care, academic tuition support, a specific ITEC mentoring program, leadership and team building opportunities, social interaction with 'mainstream' students via the UniReady options and other social and academic interaction with Indigenous and mainstream students across the University. The built environment at the Centre regularly accommodates academic style presentations/events, which assists with integration to the university generally.

### **Expected / desired outcomes from this project**

The most important/desired outcome from this action research will be increased retention rates; the harbinger of successful completion. However, retention and successful completion are not the only desired outcomes. Of great relevance is that students will emerge confident and able to undertake mainstream degree study, fully equipped to achieve in similar student numbers as the mainstream in Australia.

Of particular relevance to this project is the recommendation that "the retention and completion rates by Aboriginal and Torres Strait Islander students [should match] the rates for those of non-Indigenous students across the disciplines, and at each of the levels of study" (Forrest, 2014, p. xvii).

Considerations of the adoption and application of the technology integration strategy include:

- Economic – students being able to afford devices and internet access;
- Social – peers and family not distinguishing the nature of technology use – especially where social media are involved;
- Physical – Learning spaces being equipped with the appropriate technologies to support online learning.

The anticipated outcomes of the integration of new technologies are:

- improvement in the retention of Indigenous students in the course
- increases in the uptake of self-directed and collaborative learning
- in-class scaffolding of the behaviours that will support learning in other contexts
- a shift in the scope of technology use towards positive learning behaviours
- development of information fluency
- fostering of self-reflection and peer-feedback
- improved engagement with learning overall.

### **Teacher preparation**

Prior to implementing this project, delivery of the course was primarily achieved through traditional ways of teaching. This approach included using hardcopy course materials such as journal articles and worksheets, and the use of technology was limited to the teacher in presenting material to students using PowerPoint and some web-based resources. Staff in the program were aware of increasing

pressure from the university to change the way learning was facilitated but didn't know how to go about making this change.

In early 2014, Curtin University established the Faculty Learning Engagement Teams (FLET) to aid academic staff to build faculty and schools' capacity to improve teaching and learning. The aim of this transformation was to increase active student learning, create highly engaging and scalable technology-enabled learning designs, and advance research on teaching and learning.

The ITEC staff worked closely with the FLET to review current practices and find strategies to increase active learning and the use of technology in the classroom. This required staff to shift away from the traditional way of doing things and focus more on using activity based, online and student focused ways of teaching. This shift presented some challenges and required staff to think differently about how sessions are designed and communicated to students. There were also reservations about using technology in class and these concerns were primarily based on fear of the technology not working and technical issues staff wouldn't be able to resolve on their own.

Professional development opportunities offered to staff about the use of iPads in teaching were not formal sessions – rather, they offered occasions to research, discuss and apply the technology, then reflect on the process to identify what worked for them and what did not. After this PD, staff were then encouraged to use the technology as part of everyday practice to ensure they were comfortable and confident in using it with students. Developing in-class activities required staff members to research and prepare online activities, such as setting up a unit-specific Scoopt.it page, developing a skeleton Group Map session, and creating questions for upload into Hot Seat.

This shift in teaching practices was gradual and did take some time, however once the staff mastered a particular online activity, they were able to move on to trialling another. As staff progressed in using the applications there seemed more interest in finding out about other online applications to trial more new strategies.

As the sheer volume of information continues to expand, the notion of 'knowledge management' and collaborative working are prime factors that will develop students' critical thinking abilities. Furthermore, the range of tools is increasing exponentially. Both students and teachers will work together to make decisions about the selection of quality online content, and through this process will work together to co-curate content. This collaborative approach to developing life-long learning qualities will have lasting benefits to the individual and their peers.

Drawing on prior research on e-learning in the context of Indigenous learners, Boyle and Wallace (2011) show that effective approaches to e-learning can be beneficial for Indigenous people socially, culturally and economically. This research offers a variety of effective approaches to engage Indigenous people in e-learning, and from this we have adopted and reshaped our approach to fit our student base.

The advantages deemed to emanate from the technology integrated approach to current teaching and learning strategies for Aboriginal students are manifold and include:

- the application of achievement of scaffolded research skills
- the specificity of the articles/opinions from a trusted curator
- the varied instructional approach – ensures that students are alert
- the use of audio visual aids which are an inherent component of contemporary student and domestic life – Social Media is here to stay
- affordability – to date the students have been supplied with technological aids
- modelling by the tutor/teacher where texts can be deconstructed in a 'team' setting (screen) and which ensure that student progress can be monitored sensitively.

This approach encompasses the concept and use of the following.

- Digital curation - quests to access information regarding their specific academic interest, which has been curated by others in their field of interest/endeavour. Digital curation will, by definition, contribute to the growing relevant/specific body of knowledge.
- Laptops and iPads in class – shifting the use of technologies towards learning activity (hardware, social media, and web based activity).
- Integrated approaches to digital curation that supported individual research, evaluation and presentation of resources, as well as collaborative appraisal and feedback; thereby scaffolding search practices, identifying information sources – building connections between and across subjects.
- Student response systems in class – Hotseat – to give voice to the quieter members of the class (to some extent addressing the “shame” response we sometimes see when working with Indigenous learners).
- Collaborative tools for brainstorming and mind-mapping – GroupMap – aiming to make knowledge construction explicit as well as fostering team and individual approaches.
- A unified approach across the ITEC units to reinforce the practices.

There were a number of observable changes to the teaching practices as a result of the integration of technology. The biggest change included shifting from the traditional teacher lead session to a student centred active participation teaching model. Teaching staff would spend a significant amount of time preparing all course materials and then deliver this to the student, but this way of teaching was not very engaging and created a dependence on the teacher to provide all the information. When the new way of teaching was implemented, the teachers began the session by providing a brief introduction to the topic and then asking students to find information about the topic to begin engaging with it. Students used the iPads to locate resources online and then had to make a judgement about the relevance and quality of the information. This student lead enquiry process meant that students took on an active role in their learning and had to think about how they would engage in learning. This shift in teaching was a huge change for the teachers as it meant that they would need to prepare differently by creating activities using technology rather than preparing all of the session content. This way of teaching resulted in students asking more questions about the topics and concepts and more learning was occurring.

The technology integration approach employed a blended approach to in class activity and the specific strategies that have been adopted are as follows.

1. Digital Curation tasks hoping to derive some of the benefits outlined by Flintoff, K., Mellow, P. & Clark, K. P. (2014):

The task is useful on many levels in that:

- Students can improve their own critical appraisal of information
- Students build a resource that can be used beyond their studies
- Students can collaborate and share these resources with their disciplinary peers
- Teaching staff can use the collections as part of their assessment strategy
- Students engage more broadly across a topic, often encountering leading edge research and developments that can be overlooked in general undergraduate studies
- The collections become a highly focused and selective distillation of information around a topic and serve as a learning resource in their own right

2. Student Response System (Hotseat) – a live feedback and response system allowing students to engage in class (face-to-face or remotely) and contribute questions, provide commentary and suggestions to the entire class. The system can enable anonymous (but accountable) participation – especially important where trust, confidence and cultural sensitivities are concerns. The system can allow a mask that enables students’ voices to be heard (Flintoff, 2012).
3. Collaborative Mind mapping/Brainstorming (GroupMap) – offers real-time (or asynchronous) interaction in organising ideas both personally and collaboratively. Groupmap could be seen as a

mind-mapping tool with capability for tracking consensus. All of these approaches are in keeping with Curtin's Transforming Learning agenda and the key indicators around the following.

- Personalisation of learning
- Active engagement
- Feedback
- Collaboration
- Scaffolded support
- Accessible learning resources
- Authentic engagement/assessment.

The overall strategy of interaction is sophisticated and well designed, to foster development of Graduate Attributes as well as personal confidence and aspirations towards learning.

**Table 1: Learning technology strategies alignment with graduate attributes and observed outcomes**

Tools	Strategies	Curtin's Graduate Attributes	Observations
Scoop.it	Find information (content)	Thinking skills Information skills Technology skills Learning how to learn Professional skills	Deeper understanding of content Self-directed learning Improved engagement Personalised learning environment Increased confidence Development of enquiry based learning approach
	Curate information (content)	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills Learning how to learn International perspective Cultural understanding Professional skills	Increased confidence in learning Transparency in allocation of group work Development of an online resources Development of Indigenous perspectives Online awareness (identity and audience)
	Review comments/content	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills Learning how to learn International perspective Cultural understanding Professional skills	Critical reflection of own and others work Improved retention of course content Self-directed learning Development of online resources Development of Indigenous perspectives Online awareness (identity and audience)
Group Map	Find information on the topic	Thinking skills Information skills Technology skills Learning how to learn Professional skills	Development of research skills and self-directed learning strategies Development of enquiry based learning approach. Increased student participation and engagement.
	Add/Share information on the group map	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills	Collaboration and team work Improved communication. Development of Indigenous perspectives. Increased confidence.

		Learning how to learn International perspective Cultural understanding Professional skills	
	Review comments/ content	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills Learning how to learn International perspective Cultural understanding Professional skills	Critical reflection of own and others work. Improved retention of course content. Self-directed learning. Development of online resources. Development of Indigenous perspectives. Online awareness (identity and audience)
Hot Seat	Respond to questionnaire	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills	Development of enquiry based learning skills. Improved engagement. Improved retention of course concepts.
Blackboard (Bb)	Review announcements	Information skills Technology skills Communication skills	Increased access and engagement in important course announcements.
	Access course materials	Apply discipline knowledge Thinking skills Information skills Technology skills Communication skills Learning how to learn Professional skills	Increased access and engagement with course content. Increased completion of unit activities.
	Access assessment details and submit assessments online	Information skills Technology skills Communication skills Professional skills	Increase in access to assignment criteria. Increase in submission of assignments through blackboard. Improvement in quality of assignments.
	Review grades and results	Information skills Technology skills	Increase in online assignment submissions. Increase in access to feedback and marks.

## Observed outcomes

The iPads provided in-class supported learning overall. As new concepts were discussed, students used search engines to discover definitions, exemplars; resources, articles, and discussion topics to reinforce and/or clarify information. The devices provided a personal learning space within the classroom and enabled autonomy and personalised learning. Students became adept in using Scoop.it, Group Map, Hot Seat and Blackboard as learning tools, and more confident in class when completing the tasks, meaning less instruction was needed.

Blackboard (Bb) progress reports were run by staff to measure the student's engagement in utilising Blackboard as the central repository for all course information. Prior to the introduction of iPads, students weren't required to access Bb during class time, however they were expected to do this in their own time. As accessing Bb was made both an in-class and at home task, there were significant improvements in the use of Bb to access all learning materials.

Using online teaching resources such as Hot Seat, Group Map, Scoop.it and Blackboard allowed the teaching staff to monitor student engagement in learning. As the information for the activities was available to both students and staff, this resulted in more transparency and accountability in learning.

Quality of the student's summaries improved on the Scoop.it webpage over the semester. Initially, students weren't providing much information about the scooped resource other than details about what the resource contained. However, as students became more critical about the information, they began to critically analyse and make informed judgements on the credibility, relevance and type of information.

The relevance and importance of the online learning strategies became apparent when students began to question and discuss the reasons why they were sourcing, analysing and evaluating information sources. Students could see that their perspectives as Aboriginal and Torres Strait Islander people could influence what information is useful or not useful and how this could help others to make informed choices about the quality and relevance of the types of information.

Observable changes were noted on the student's perception of their online identity and audience as they built and curated content on Scoop.it. Students questioned their summaries' quality provided on the Scoop.it site and began to offer each other advice on how they could improve the information being published in the online space.

Teachers embedded reflective tasks at the beginning and end of each session to assist students in recall and retention of information covered in each session. There was a notable improvement in students' ability to recall previous activities, discussions and knowledge of concepts covered in previous sessions. Using a variety of rich media resources, collaborative strategies to engage in content, and easy access to online sites where information was collated throughout the semester is seen as the contributing factors to this improvement in retention of knowledge.

While it was evident that students were highly motivated to use the technologies in class, we also noticed that students seemed to be reluctant to engage when the devices were occasionally absent, and intend on further iterations of the program to examine the reasons for this. We have speculated that students are beginning to break away from a dependency upon teacher-led activity and are starting to use the technologies – which act as a connector between learners – as tools to enhance their autonomy as learners.

The levels of digital literacy varied among the cohort of students and it was apparent that the younger students had higher levels of digital literacy compared with the smaller group of mature age students. This variation meant some students were more proficient at participating and completing the online activities than others. Staff trialled a number of support strategies in class, including a buddy support model and additional instructional support, however further investigation is required to identify how to effectively engage and retain students that have inadequate levels of digital literacy.

A further consideration was the student expectation of the way learning is facilitated in the classroom. While some students adapted to the self-directed method of learning and embraced the learning tasks, other students expected that learning would be far more 'traditional' and teacher-directed. The shift away from teacher-directed to student-directed learning was challenging for some students, particularly mature aged students who had only experienced this way of learning.

A number of significant improvements to the student's learning were noticeable to staff at the end of the semester, including improved engagement in learning, more collaboration in class activities, and development of self-directed skills to identify, analyse information and make judgements on the credibility and relevance of content. Students were far more independent and self-directed in their learning. This increased level of engagement in learning may also be attributed to the increase in attendance rates as we saw more students attending classes throughout the semester whereas there would generally be less students attending as the semester progressed.

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