Myth-busting in an Aboriginal pre-university enabling program: Embedding transformative learning pedagogy

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Pre-university bridging programs can address the significant under-representation of Indigenous students in Australian universities by providing culturally supported alternative pathways into undergraduate study. However, successful completion of bridging programs does not always correlate with university enrolment for Indigenous students. This paper offers a pedagogical rationale for an Indigenous bridging program that aims to address this discrepancy. The program curriculum challenges deficit myths about Aboriginal and Torres Strait Islander Australians and education, while developing foundational academic skills for university study. Leveraging transformative learning and cultural interface theories, the program aims to empower students with the opportunity to develop their own narratives about Indigeneity and university, free from deficit stereotypes. Since implementation of this myth-busting pedagogy, Indigenous student records indicate marked improvement in bridging program pass rates and in transitions into undergraduate study. Additionally, enrolments into science, technology, engineering and maths (STEM) tripled. Students' weekly reflections, collected over seven iterations of the course, suggest that the transformative pedagogy developed students' self-awareness, self-efficacy, self-confidence and sense of belonging at university.

Keywords: Indigenous higher education, transition pedagogy, Indigenous students, cultural interface, transformative learning, pedagogy

Introduction

The educational, economic and health outcomes for Aboriginal and Torres Strait Islander¹ Australians fall well below those experienced by the majority of non-Indigenous Australians. Against a range of social determinants, including life-expectancy, social and emotional wellbeing, employment, housing, and education, Indigenous peoples are consistently reported as experiencing disproportionate disadvantage in Australia (Department of the Prime Minister and Cabinet, 2018; Wilks & Wilson, 2014; Kildea, 2013). Only 1.7 per cent of Aboriginal and Torres Strait Islander people hold university

¹ In Western Australia, most Indigenous people identify as "Aboriginal". This term is used interchangeably with Indigenous and Aboriginal and Torres Strait Islander to acknowledge local identification; however, its use is not intended to exclude Torres Strait Islander people from the conversation.

qualifications (Department of the Prime Minister and Cabinet, 2018). This is compared to 31.4 per cent of Australians overall (Australian Bureau of Statistics, 2018).

One strategy to address the significant under-representation of Indigenous students in Australian universities is the pre-university bridging course. Bridging programs are integral to increasing the engagement of Aboriginal and Torres Strait Islander people in higher education (Fredericks et al., 2017; Kinnane et al., 2014); in 2010 they accounted for more than half of all Aboriginal and Torres Strait Islander university enrolments (Behrendt et al., 2012). Further, while vocational education and training (VET) accounted for the highest overall alternative transitions into Australian universities, bridging programs were the primary pathway for Indigenous students (Behrendt et al., 2012).

Bridging courses (also known as access or enabling programs) vary from institution to institution in terms of structure, delivery, curriculum, and duration. They also present complex pedagogical and curriculum challenges in that they cater to a wide range of students, including near-miss direct-entry students, mature-age students, those with disrupted educational backgrounds, and those with a range of equity backgrounds. Key commonalities in these courses are their focus on academic skills development, university acculturation and foundational disciplinary knowledge. In 2015, 27 of 38 Australian universities offered bridging programs, 14 of which were Indigenous-specific (Pitman et al., 2017).

Indigenous students who enter university through a bridging program have higher rates of transition and retention than those who enter directly through traditional entrance exams. Further, there is no significant difference in students' success rates (subjects passed) between bridging and direct-entry students (Pitman et al., 2017). However, Indigenous students struggle to remain for the duration of a degree, with only 41 per cent completing a degree within six years (DET, 2019). This figure might be attributed to factors such as low numbers of university graduates in community networks, a low percentage of Aboriginal people in university populations and a lack of Indigenous perspectives in curricula (Sonn et al., 2000; Wilks & Wilson, 2014).

At an epistemological level, Australian Indigenous scholars highlight the role that universities play in the marginalisation, silencing and erasure of Indigenous knowledges, histories and peoples (Langton, 1993; Moreton-Robinson, 2004; Nakata, 2007b). The dominance of Western knowledge paradigms in academia devalues holistic, integrated and spiritual approaches to knowledge creation that are found in traditional and contemporary indigenous epistemologies throughout the world. To prevent ongoing "epistemicide" (De Sousa Santos, 2014), global academia must genuinely embrace not only indigenous students, but also indigenous ways of knowing, learning and teaching. Until this time, university should not be positioned as automatically liberating, enlightening or transformative for indigenous students. Thus, when designing curricula for Aboriginal students, it is important to destabilise myths about university education, and myths about Aboriginal people, which suggest they are educationally deficient. Deconstructing such myths for Indigenous transition students exposes and undermines essentialist tropes that support settler-colonial hegemony; situating curriculum content in conversation with Indigenous and Western worldviews allows differing epistemologies to co-exist, without the need for resolution.

This paper offers the pedagogical rationale for a full-time, semester-long Indigenous pre-university bridging program at a medium-sized university in Western Australia, called K-Track.² To address low pass and completion rates, course designers developed a pedagogy based on aspects of Mezirow's

² The "K" in K-Track, stands for Kulbardi, which is the name of the university's Aboriginal centre and means magpie in Noongar language. Kulbardi's motto is "wings to fly".

evolving transformative learning theory (TLT) (1997; 2009). The rationale for TLT was its focus on challenging adult students' preconceptions, and in this case their "limiting beliefs" about their educational capacity based on internalised cultural stereotypes (Mezirow, 1997). The aim was to position Aboriginality and university as potentially mutually reinforcing, not competing, priorities. Thus, the bridging curriculum challenged deficit societal beliefs about Aboriginal and Torres Strait Islander peoples and education by explicitly critiquing the discourses and stereotypes that perpetrate them.

The pedagogical design was instigated by authors Strehlow, a non-Aboriginal scientist, and Hill, an Aboriginal humanities lecturer, who is now Pro-Vice-Chancellor, Equity and Indigenous, at a different university. Lead author Bennett, a non-Aboriginal social scientist, has helped to develop and refine this pedagogy in subsequent iterations of the program. Our combined pedagogical rationale is informed by our collective positionality and investment in the success of the bridging program in terms of delivering an empowering student experience. We then explain translation of the pedagogy into practice by deconstructing three myths about Indigenous Australians that have the potential to discourage long-term engagement with university learning. Finally, the pedagogy is illustrated by 30 students' reflective journal assessments and by publicly available transition-rate and discipline-choice student data.

Collected from Aboriginal students over seven semester-long iterations of the bridging program, the cohort was a diverse mix of genders, ages and schooling experience. Journal data was collated from a reflective assessment in the bridging course curriculum, not an empirical study. It was designed to align with the TLT pedagogy, not for the purposes of research. Thus, this data is illustrative, not evaluative. Most weeks, student responses were self-generated, but at three points throughout the semester they were asked to reflect on how they had changed since starting the course. The journal reflections suggested progressive increases in students seeing university education as personally and culturally valuable. This may be related to the marked increase in student transitions to undergraduate degrees. However, such indicative patterns require future testing for empirical validation.

Deconstructing the Indigenous/university dichotomy

Torres Strait Islander academic Martin Nakata situates Indigenous university student experience within a "contested space between two knowledge systems" (Nakata, 2007a, p. 9). At this "cultural interface" (Nakata, 2002), students can experience competing identities, such as cultural versus student, because dominant discourses can make it difficult to see a way to integrate both into a meaningful whole. The pressure of navigating seemingly disparate cultural contexts (Bullen & Flavell, 2017) means Indigenous students can experience additional cognitive and emotional load compared to non- Indigenous students at university.

Cultural interface theory (CIT) acknowledges that Indigenous and university epistemologies are not necessarily distinct; rather, Indigenous university students experience a "transforming process of endless instances of learning and forgetting, of melding and keeping separate, of discarding and taking up, of continuity and discontinuity" (Nakata, 2007a, p. 10). The task of operating in this "multi-layered and multi-dimensional space of dynamic relations" (Nakata, 2007a, p. 199) has intellectual and emotional consequences due to a lack of clarity, security and certainty. Ultimately, however, the cultural interface evokes space for transformation and growth, which can lead to enriching and empowering understandings of self, culture and capacity. Nakata's CIT aligns with elements of Mezirow's TLT, because both suggest that disorientation of identity in higher education experiences can be harnessed as a catalyst for positive and empowering change.

Transformative learning theory

From Mezirow's (1997; 2000; 2006) perspective, transformative learning refers to educational experiences that expand and transform (usually, adult) students' worldviews. The catalyst for this transformational change is a "disorienting dilemma" (Howie & Bagnall, 2013; Kitchenham, 2008) that exposes students to unfamiliar ways of making sense of the world and causes them to question preconceived ideas and understandings. Mezirow argues that people's "meaning schemas" are comprised of a set of assumptions that "selectively shape and delimit expectations, perceptions, cognition, and feelings" (Mezirow, 1997, p. 5) and, when these assumptions are challenged, students feel disoriented because they are forced to question the logic that had previously informed their sense of self.

Kitchenham (2008, p. 115) summarises Mezirow's early work as a 10-phase progression, which marks a journey from disorientation, through processes of critical self-reflection and knowledge acquisition, to transformation. However, some argue that 10 phases are too few to capture the nuances of transformation (Cranton, 2005; Dirkx, 2006; Kegan, 2000; Taylor, 2007); while others label it too broad and suggest the model could relate to any learning beyond traditional classroom practice (Illeris, 2014; Newman, 2012).

While the model is contested, elements are useful measures of attitudinal change. Brock's (2010) review of transformative learning research found the most reported elements were disorienting dilemma, critical reflection and trying on new roles. Bullen and Roberts (2019a) position critical reflection as the most crucial factor, as it catalyses the disorientation necessarily for transformation. Thus, it is important that a transformative learning pedagogy increases students' capacity for critical reflection and encourages explorative and open responses to situations that challenge pre-existing worldviews.

Outside of an Indigenous context, transformative curriculum design has been applied in courses aiming to improve nursing students' preparedness to work with minority groups, in both mental health (Happell & Gough, 2007) and rural (Sedgwick & Yonge, 2008) contexts. Applications of transformative learning pedagogy have been shown to promote inclusive understandings of Aboriginal culture amongst (mostly non-Indigenous) Australian students in health science (Bullen & Roberts, 2019b) and Australian Indigenous studies (Bullen & Roberts, 2019a). However, the efficacy of a TLT approach has yet to be tested for Australian Indigenous students.

In K-Track, to adapt TLT to suit an Indigenous bridging cohort, focus was placed on the emancipatory potential in inclusive understandings of identity. Illeris (2014) and James (2002) suggest that transformative learning encourages students to engage in a negotiation of who they are. Additionally, Howie and Bagnall (2013) focus on the emancipatory capacity of viewing transformative learning as a metaphor, being "a revolutionary enlightenment in a person's psyche—neither simply a learning of skills or ideas, nor simply an awakening in some spiritual sense, but an awakening that leads to new learning that otherwise would not have occurred" (p. 822).

This perspective is echoed by Mezirow (2009), who defines it as "learning that transforms problematic frames of reference to make them more inclusive, discriminating, reflective, open, and emotionally able to change" (p. 58). The transformational aspect of adult learning that leads to an inclusive and expanding sense of identity was the pedagogical priority for K-Track's bridging curriculum. The aim was to help Aboriginal and Torres Strait Islander students ameliorate societal, cultural and self-imposed obstacles that could deter them from university study. By strategically challenging a settler-colonial legacy that suggests Aboriginal people do not belong at university, it was hoped that students might leverage

university study to empower and reinforce their Indigenous identity, seeing Indigeneity and university as mutually reinforcing constructs, instead of fearing that one might dilute the other.

Myth busting as a catalyst for transformation

Implicit, explicit, casual, and overt racism in settler-colonial Australia (Bastos et al., 2018) means that many Indigenous Australians have first-hand experience of having their cultural identities questioned, criticised and mocked (Larson et al., 2007; Mellor 2003). To harness the empowering elements of TLT, the K-Track curriculum challenged deficit narratives that underpin systemic racism through exposing them as myth. The definition was based on Barthes's concept of mythologies (1972), which revealed the capacity of language, signs and symbols to construct false truths. This is the process by which the repetition of stories, that seek to define a cultural group, works to naturalise belief-systems, despite their symbolic or fictive foundations. Myth "abolishes the complexity of human acts, [and] gives them the simplicity of essences" (Barthes, 2000, p. 170). Thus, myths ignore complex, dynamic and interconnected aspects of culture to offer simple definitions that support the status quo.

In Australian national discourse, myths about Aboriginal and Torres Strait Islanders explain Aboriginal identity through a series of romantic, deficit or deviant stereotypes. These stereotypes are often believed by Aboriginal students and can impact their academic self-efficacy and sense of belonging in educational institutions (Dandy et al., 2015). Essentialist understandings of Aboriginal identity can also lead to lateral violence within Aboriginal communities and to perceptions that Aboriginal people are "selling-out" or "turning White" by pursuing tertiary study (Hill et al., 2020).

Myth-busting pedagogy in practice

The K-Track Indigenous bridging program is situated in an Aboriginal centre at a medium-sized university in Western Australia. The centre provides support to Indigenous university students at all degree levels. It has offered a pre-university bridging course since 2004.

With a pedagogy focused on academic skill development and university-readiness, the original bridging course, KATEC (Kulbardi Aboriginal Tertiary Entrance Course), had limited success. Over the seven years it ran, an average of only three students per year passed the course, and completions declined over time; the highest number (six) was in KATEC's first year and the lowest number (zero) in its final year (see Figure 1a). While pass rates were low, most of the students who completed KATEC transitioned into undergraduate degrees. However, only 2 per cent of these successfully completed their first year of degree study. Further, only 18 per cent of KATEC graduates transitioned into science, technology, engineering or maths (STEM) degrees.

In 2011, the Aboriginal centre ordered a review of the KATEC bridging course to improve pass and transition rates. The review solicited formal and informal feedback from students and teaching staff, and consulted Indigenous higher education literature. In the literature, reasons for attrition were complex. They included financial hardship, stress, study/life balance, a lack of cultural safety, and ineffective health and support services (Behrendt et al., 2012; Day et al., 2015; Wilks & Wilson, 2014). The Aboriginal centre supplemented financial, health, counselling and support services, so the curriculum redesign focused on study/life balance and stress-reduction. Additionally, the reflections of Indigenous university graduates were considered.

In a collaborative autoethnographic analysis (Hill et al., 2020), three Aboriginal graduates who had transitioned through KATEC attributed their success to shifting perceptions of themselves and their world, particularly family, culture and identity. During university, they found a transformed sense of Aboriginality that was less attached to doing and more attached to being Aboriginal:

You grow up thinking that Aboriginal means being poor, unemployed, not being able to look after your kids, being a drunk—it's sometimes all you see—but once you understand that this is founded in stereotypes and internalised racism, you understand that being Aboriginal is so much more—it's like you realise regardless of what you do, you're still Aboriginal. (Hill et al., 2020, p. 5)

Additional research shows that Indigenous education is linked to increased confidence and self-esteem. For example, Hall (2015) found that, for Indigenous students, engagement with university learning presented encounters with new and/or challenging experiences that changed perceptions of self-worth, self-efficacy and worldview. K-Track was designed to encourage such transformational experiences, with the long-term goal to make university graduation a norm, not an exception, for Indigenous students.

In TLT, students re-evaluate their positions and consider where they sit with regards to complex issues and socio-cultural-personal dichotomies (Mezirow, 2000). Thus, K-Track curriculum activities deconstructed cultural myths, not only about Indigeneity, but about science, class, gender, sexuality, race and citizenship. These are explored in two core subjects: Big Ideas (humanities) and Understanding Your World (science). In Big Ideas, students identify ways that structural inequities are reinforced through myths about class, gender, sexuality, citizenship and Indigeneity in media and populist political discourse, exposing their socially constructed foundations. Understanding Your World acknowledges the significance of Indigenous knowledge to understanding the physical and natural world, and its commensurability with Western science. The Writing Toolkit (academic writing) subject is focused on the explicit development of research, referencing and writing skills, through which students explore Big Ideas topics. The fourth and final subject in the course is iHealth (self-knowledge), which focuses on addressing limiting beliefs and behaviours at an individual, as opposed to cultural, level. By focusing on physical, emotional and spiritual wellness strategies—including journaling, drawing, Aboriginal sound relaxation sessions, yoga and personalised gym workouts—students are empowered with Indigenous, Western and Eastern tools to care for their physical and mental health while at university (see Table 1).

Table 1: Transformative learning curriculum overview

Subject code	KAC001	KAC002	KAC003	KAC004		
Subject name	Big Ideas	Writing Toolkit	Understanding Your World	iHealth		
Year of implementation	2012	2012	2012	2015		
Academic discipline	Humanities	Academic literacy	Sciences	Health		
Aboriginal identity	Intersectional Aboriginality	NA	Aboriginal voices in science	Aboriginal health/ My health		
Emphasis	Diverse experiences of disadvantage	Academic writing	Intersections between Aboriginal/Western science	Agency, autonomy and self-care		
Skill development	Academic reading	Academic argument	Data analysis	Data analysis		
	Discussion	Essay structure	Report writing	Self-awareness		

 Argumentation	Research	Experimental design	Journaling		
Self-reflection	Referencing	Tables and figures	Mindfulness		
Oral presentation	Paragraph structure	Numeracy	Stress reduction		
Summarising	Paraphrasing	Excel	Nutrition		
Critical reflection	Critical analysis	Oral presentation	Fitness		
Critical thinking	Critical thinking	Critical thinking	Critical thinking		
Self-reflection	Self-reflection	Self-reflection	Self-reflection		

From a pedagogical perspective, TLT informed the K-Track curriculum design around challenging three myths about Aboriginal people that emerged during the KATEC auditing process. Indigenous lecturers and students felt the original bridging program adopted a remedial focus, with content that was disproportionately focused on addressing assumed challenges facing Indigenous students in practical and literacy contexts. This curriculum choice downplayed students' cultural and intellectual capacity for university study, overlooking their strength, determination, resilience and agency. This critique led to the identification of three (false) assumptions with the potential to lead Aboriginal students away from—rather than towards—university. The first was that Aboriginal people are inherently disadvantaged: thus, to be born Indigenous means a more difficult life (Big Ideas). The second was that Aboriginal ways of knowing and Western science are opposite ways of thinking: thus, Aboriginal people are not naturally or culturally suited to science (Understanding Your World). The third, explored in iHealth, a later addition to the curriculum, was that Aboriginal people are unhealthy and unhappy: thus, they lack the physical and emotional resilience of their non-Indigenous peers. To ground the pedagogy in praxis, examples of how each of the three myths are "busted" in the curriculum are provided, illustrated by reflections from students' journals that suggest a transforming sense of identity, efficacy and worldview.

Myth 1: Indigenous Australians are disadvantaged

In Australian socio-political discourse, there is a perception that Aboriginal Australians are educationally, economically and socially "behind" non-Indigenous Australians. This perception is not unique to the Australian context; rather, it is a recurring theme in colonial discourse, supported through infantilising narratives about the "uncivilised" native, both benevolent and cautionary in nature (Chrisman & Williams, 1993). The disruption of the myth that Aboriginal people are intrinsically less capable than their non-Indigenous peers begins by acknowledging that, statistically, Indigenous Australians experience greater disadvantage; however, generalisations are not representative of the lived experience of individuals. From a pedagogical point of view, to focus curricula on Indigenous-specific issues might reinforce a deficit perception that university is going to be harder for them because they are Indigenous.

The subscription to deficit myths about Aboriginal people was apparent in early student reflections. For example, student 8 wrote: "I didn't think I would see other Aboriginal people who were motivated and responsible. It's finally great to see."

While student 25 worried: "People might treat me different because I'm Aboriginal. They might think I came into university the easy way."

Students' internalisation of stereotypes that position Indigenous people as lazy and irresponsible (linked to the "uncivilised" native in colonial discourse) was expressed alongside fears of externalised stereotyping resulting in discrimination. The perception that Aboriginal students receive unjustified special treatment and advantages is a contemporary myth that persists in settler-colonial nations in response to targeted social equity initiatives for Indigenous peoples (Pedersen et al., 2005).

To overcome the impact of myths suggesting Aboriginal people are not "naturally", "culturally" or "cognitively" predisposed for university study, the humanities subject, Big Ideas, takes an intersectional approach (Crenshaw, 2017). Unlike Indigenous bridging programs that offer units focused on Aboriginal identity and history, this subject focuses on exploring power and discrimination based on a range of factors, including gender, sexuality, citizenship and class. The pedagogy of Big Ideas aims to show students that their opinions and perspectives, which are framed through their unique and collective Indigenous standpoints, are important to the world of ideas that university learning explores. Student journal entries that reference Big Ideas indicate growing confidence and enjoyment in a widening perspective that embraces diverse presentations of identity and the process of critical thinking. For example, student 13's journal stated:

Big Ideas gave me a whole new perspective on life The readings were based on issues that society faces each day, and it gave us more of a reason to critically think and think deeper about our ideas on the issues rather than just identifying the simple things that are easier to see.

Student 9 wrote:

My eyes are so open to the world, which I love. I love learning about all the different things in the world and how everyone is different. I have been finding myself watching YouTube videos at home, they are about individuals and their journeys or struggles to become the people they want to be. For example, trans people or vegan people.

The transformative potential in a learning environment where Aboriginal students engage with global, not only culturally specific, issues helps de-exceptionalise discrimination as an Indigenous-only experience and enables students to interrogate dominant power structures with a degree of personal and cultural distance. This critical distance allows students scope to address discrimination within their own communities and bias within themselves. For example, after a lecture delivered by three asylum seekers, student 14 articulated frustration with their peers' response:

I know this issue of refuges [sic] stirs different emotions amongst people, but one of the class members felt it was necessary to voice their opinion which came across as quite rude and intimidating. It made me extremely angry ... this comment also made a few other members angry, and we later discussed how it made us feel ... and came to the conclusion that the comment was just pure ignorance.

Student 11 reflected upon their own bias: "I've (also) been trying to change my implicit biases, which I have reluctantly accepted. I've since realised they are not anything intentional and not ... the way I consciously choose to react to people."

In relation to inherent bias, student 30 wrote:

I tend to just see black and white and not read between the lines — but asking why, then why, then why, then why, and so on really gets down to the essence of the situation, and this is underlying information that we can dig up about anything. I found myself critically thinking about everyday issues, which I like to do now, before it was more of a chore to excessively think but it helps [to] understand people's motives and reasons why we find ourselves in certain situations.

Finally, while Indigenous issues are not a central focus in Big Ideas, students are encouraged to link the issues discussed to their experience as Aboriginal people. The only topic specifically on Aboriginality is introduced in the second half of the course. This topic critiques issues of racial purity, including skin colour and cultural knowledge, as students critically discuss their diverse perspectives on what constitutes Aboriginality. The following journal reflections, of student 16 and student 1 respectively, indicate a growing awareness of diverse Aboriginal identities—and a reduction in potential for lateral violence—as a direct result of this lesson:

When we looked at Aboriginality and what it means to be Aboriginal, I found that interesting. I found that the ... ideas and perspectives people portrayed were all different, and [this] shows that everyone sees and experiences things differently. This had an impact on me as it made me see things from other people's point of view.

It is making me think who I am. Look at me, I don't look Aboriginal, yet I am.

Other reflections offer indirect re-conceptualisations of what Aboriginal people can be and do that counters deficit positionality. For example, student 2 wrote:

Stepping outside of what I grew up in didn't mean that I was being white; it meant that I could be a strong Aboriginal person and do well in life. I could go and get an education without that making me a "coconut".

Reading student journal reflections illustrates the efficacy of an intersectional approach to humanities themes for this bridging cohort. They illustrate expansive and open perceptions of Indigeneity, a reduction in deficit beliefs, and an increase in confidence to add their voice to discussion of global and local issues.

Myth 2: Indigenous culture is not scientific

While Big Ideas de-emphasises Indigenous-specific issues from a humanities perspective, the science subject, Understanding Your World, re-emphasises Indigenous approaches to knowledge about the physical and natural world. Scientific disciplines have an uneasy relationship with Aboriginal culture because they are linked to colonisation, racial classification, oppression and a dismissal of Aboriginal worldviews (e.g., Rigney, 2001). This tension was potentially reflected in university enrolments from the original Indigenous bridging course (KATEC), where only four students from that course transitioned into STEM degrees over a six-year period. Given the low uptake in STEM, the focus on moving past limiting notions of the relationship between Indigenous epistemologies and science was deemed particularly important in the curriculum design.

To encourage greater interest and engagement in STEM, the myth that Aboriginal knowledge is not scientific is challenged through several examples that explicate Aboriginal deep knowledge of the natural world, particularly in terms of sustainability and the environment. This approach aimed to alleviate long-

held Aboriginal mistrust in Western science by situating Indigenous and Western knowledge systems side-by-side, acknowledging differences and emphasising mutually reinforcing intersections.

This two-lens approach resonated in enthusiasm for science in student journal reflections, such as that of student 24: "I've really liked learning how Western science and Aboriginal people can work alongside each other and I feel just a little bit more knowledgeable now after completing this science unit."

Growing enthusiasm for the application of STEM skills, such as numeracy, was also evident through a culturally motivated gaze, as evidenced by student 30: "I love math and bringing the Indigenous knowledge into it has excited me to learn more about my culture."

The embedding of Indigenous perspectives also appeared to strengthen students' cultural pride and consolidate the importance of Indigenous epistemologies in the scientific canon. Student 32 wrote:

[This subject] got my mind thinking and realising how epic our race is. Throughout our history on earth, Aboriginals have not only survived but endured sustainably.... It fills me with pride to know that our ancestors knew the balance required to maintain a livelihood and live harmoniously in their countries.

Finally, considering ways that Aboriginal knowledge might address ecological challenges, such as global warming, climate change, and land management, saw students flip the paternalistic colonial script that suggests Indigenous people need "saving". Instead, the following reflections, by student 32 and student 38 respectively, position Indigenous perspectives as a necessary solution for global issues that were, in part, caused by Western science:

Of the 100s of 1000s of years humans have been around, White man has managed to decimate our population and endanger and [make] extinct many, many other species. This is the missing connection that I believe the Western world is trying to understand and learn from us.

[Climate change] is such an interesting topic. I can now see that they [climate scientists] really need our knowledge.

Myth 3: Indigenous Australians are unhealthy

In the first iterations of K-Track, elements of TLT informed the three-subject Indigenous bridging program: Big Ideas, Writing Toolkit and Understanding Your World. Each of the three core subjects focused on academic skill development through critical analysis of broad cultural, scientific and theoretical issues to iterate a need for more Indigenous voices at university. The addition of a fourth subject, iHealth, was included to address the transition to university through the development of complementary personal, practical and emotional skills that have been attributed to sustained interest and motivation to complete tertiary study (McKenzie & Schweitzer, 2001). The pedagogic rationale for iHealth was two-fold. Conceptually, it aimed to bust the myth that Aboriginal people are passive victims in an unfair system and, as such, have limited agency and control over their physical and mental health. Practically, it provided students with physical and psychological tools to cope with the stresses that transitioning into university, particularly at the cultural interface, can cause.

Like Understanding Your World, iHealth adopts a two-lens approach to mental and physical health, because Indigenous perspectives are traditionally excluded from health science discourses, just as they

are in physical and natural scientific disciplines. In this subject, students critically engage with the prevalence of health conditions that are overrepresented in the Indigenous population. Aboriginal health professionals deliver lectures about community health problems and possible solutions, with the understanding that these are a consequence of colonisation and persistent marginalisation in a settler-colonial nation.

Practical strategies for addressing physical health issues include customised personal training sessions with exercise science students in their final year, yoga sessions, nature walks with local elders, and Indigenous cooking workshops focusing on the health benefits of traditional Indigenous diets and foods. The connection between health and culture is evident in journals, with student 17 reflecting:

iHealth teaches us about ourselves mentally and physically. It teaches us about problems that affect Indigenous people ... iHealth gives us a deeper knowledge of Indigenous health and our own health. It helps us learn about how to take care of our bodies and find both a physical and [a] mental balance when studying.

To address social and emotional health in an explicit manner, this subject includes sessions on mindfulness, meditation, and journaling, integrated with local Aboriginal approaches to healing, calm and mental clarity. The teaching of mindfulness incorporates complementary Indigenous constructs, such as art and sound healing, as well as aspects of Kabat-Zinn's (1990) mindfulness-based stress reduction program. Students are often sceptical of mindfulness constructs at first, but acknowledge their health benefits towards the end of the course, as this journal entry by student 10 articulates:

I wasn't really interested in mindfulness to begin with, but as of last week I have noticed I can take these skills and practice them to benefit me in the future especially around my studies and at home when I'm feeling stressed ... I found the ability to train your mind to be in the present moment very interesting. I always find that I think ahead and too far into the future instead of really focusing on what it is I'm supposed to be doing. The small activities we did ... taught me to be present.

A key intention of the iHealth curriculum was to provide students with knowledge and skills that develop a sense of agency towards their own physical, social and emotional wellbeing. The following journal excerpts, by student 33 and student 26 respectively, indicate increased confidence and ability to cope with stressors that may impact learning:

I believe the purpose of the iHealth unit to be one that empowers the student and allows them to take control of their own lives. This is not only in regard to study, but to life altogether. iHealth has given the students many ways of coping with everyday stressors that can interrupt the course of study, [including] physical and mental health.

Now that I have realised, I need to engage in learning strategies to cope and I believe that is the main premise of the iHealth unit. It is to empower the student and make them an emotionally stronger individual.

The sense of empowerment regarding physical and mental health in student journals, at both individual and cultural levels, counters deficit discourses that uncritically link Indigeneity with poor health.

Efficacy of the transformative learning pedagogy in student data: KATEC vs K-Track

Beyond the illustrative data apparent in K-Track students' journal entries, which alluded to personal and academic growth in response to the myth-busting curriculum, analysis of K-Track enrolment, completion and transition data—collected over 13 years of Indigenous bridging course delivery—suggests a possible correlation between the myth-busting pedagogy and increased transitions into university. However, this claim requires further empirical testing to be validated in any concrete manner.

Table 2: Aboriginal and Torres Strait Islander bridging student data 2005–2017

	Year														
		05	06	07	80	09	10	11	12	13	14	15	16	17	TOTAL
K A T	Enrolments	49	45	17	27	59	71	26							294
	Completions Completion	6	4	1	3	4	1	0							19
E C	rate %	12	9	6	77	7	7								6%
C	Transitions Transition	5	3	1	3	3	1	0							16
	rate%	83	<i>75</i>	100	100	<i>75</i>	100								84%
K	Enrolments								26	35	81	35	51	39	267
T	Completions Completion								14	12	24	12	17	24	103
1	rate %								54	34	30	34	33	62	39%
a c k	Transitions Transition								2	10	19	11	16	21	79
n	rate%								14	83	79	92	94	89	77 %

In the original bridging course, KATEC, enrolment numbers were high; however, course completions and subsequent transitions into university majors were low (see Table 2). Additionally, the number of completions steadily declined over the seven years the course ran, from six completions in 2005 to zero in 2011 (see Figure 1a).

Since the implementation of the K-Track myth-busting curriculum, the total completion rate increased from 6 per cent in KATEC to 39 per cent in K-Track (see Table 2). Additionally, the number of annual completions in K-Track has been higher than the maximum number achieved in a single year throughout KATEC's history. In terms of student transitions from enabling into university, transition rate data falsely appears higher for KATEC (see Table 2) because it is based on nominal completions (average of 2.7 completions and 2.3 transitions, per semester). However, when the raw data is taken into consideration, the actual numbers of transitions from K-Track into university are significantly higher (average of 13 transitions per semester).

Finally, while there are fluctuations in the completion and transition data for K-Track, the decline evident in KATEC (see Figure 1a) has reversed, with a subtle increase in completion rates and a steady increase in the number of students who then transitioned into university degrees (see Figure 1b). A comparison of the two programs over time shows a significant jump in the numbers of completions and transitions after the myth-busting pedagogy was introduced, as well as a trend suggesting that these numbers are likely to continue to increase over time.

Figure 1a: KATEC course completions and transitions 2005–2011 (number of students)

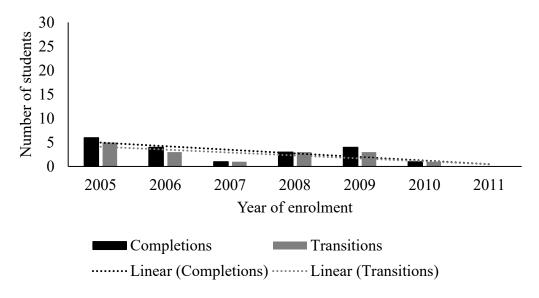
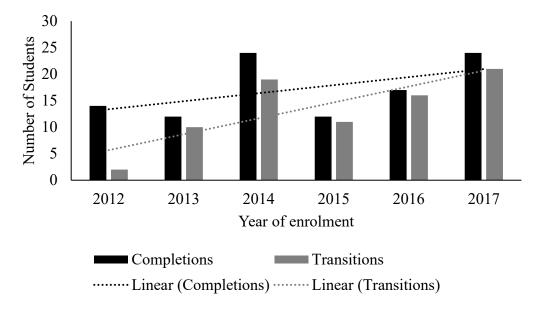


Figure 1b: K-Track course completions and transitions 2012–2017 (number of students)



Student enrolment data indicates that a curriculum focused on TLT and myth busting may have influenced increases in Indigenous bridging course completions and transitions into undergraduate studies. In terms of the third pedagogical aim to encourage a greater uptake in STEM degrees, the two-lens approach to science in Understanding Your World and iHealth may also have influenced increases in the percentage of successful bridging students selecting science, technology, engineering or mathematics degrees, which increased from 18 per cent in KATEC to 45 per cent in K-Track (see Figure 2).

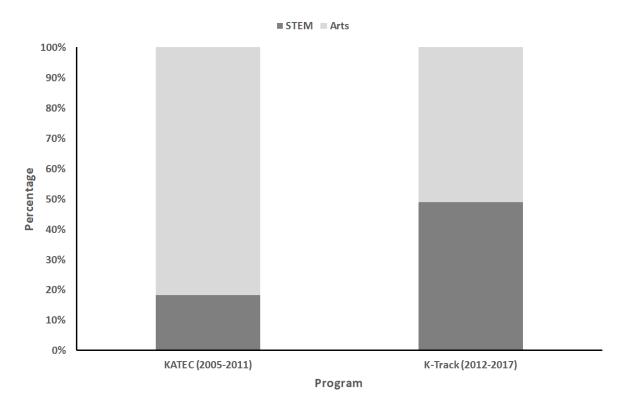


Figure 2: Indigenous bridging students' undergraduate enrolments by discipline: KATEC vs K-Track

Conclusion

In sum, to address low completion and transition rates in the KATEC Indigenous bridging course, a new Indigenous bridging curriculum was created to develop key academic skills, whilst also unpacking cultural myths and generalisations that could lead Aboriginal students to think university is not for them. It is inaccurate to suggest that the curriculum and pedagogy alone contributed to increases in success rates; the curriculum redesign was part of a broader organisational shift, which included appointment of new teaching staff and a whole-of-university strategy that emphasised a focus on student success and academic support. Nevertheless, the indicative success of K-Track is supported by student completion and transitions data, and by the correlation between curriculum content and increasing self-knowledge and academic self-efficacy that appeared in several of the students' journal entries. Created with the aim to embrace a diverse, expansive, positive and inclusive space for modern Indigenous identity and ambition, the K-Track curriculum was based on a strong conceptual pedagogy, informed by the integration of Mezirow's TLT and Nakata's cultural interface theory. The curriculum challenges and critiques three dominant myths about Aboriginal people in Australian society, each of which holds the potential to deter Aboriginal and Torres Strait Islander people from pursuing undergraduate study. The myths are Indigenous Australians are disadvantaged, Indigenous culture is not scientific and Indigenous Australians are unhealthy.

It is important to acknowledge that the myths being busted in the K-Track curriculum are supported in Australian population demographics and broad-stroke statistics that map significant discrepancies in life-expectancy, income-level and education between Indigenous and non-Indigenous Australians

(Department of Prime Minister and Cabinet, 2018). However, when representations of Indigenous Australians are welded to deficit discourses about "closing the gap", Aboriginal identity becomes associated with victimhood. Victim stereotyping is pedagogically dangerous because it can be paralysing for both student and teacher: Aboriginal students may feel as if they must work harder than others, because the system is against them; teachers may have lower expectations for Aboriginal students. A curriculum that focuses on statistical deficits overlooks strength, agency and diversity in contemporary Aboriginal experience, and silences positive and empowering stories of Indigenous resilience, pride and success in the popular consciousness.

While this study was not intended to empirically evaluate whether transformative learning was occurring for the students, TLT did guide the course pedagogy and would make an important addition to future research. Revealing what appear to be cultural "truths" as cultural myths can challenge students' long-held beliefs about themselves and others, leading to a period of disorientation and reflection, which then has the potential to expand and transform their worldview to maximise their capacity for university success. That being said, it is also important to acknowledge that the burden of "transformation" should not solely be placed on Indigenous university students, insofar as they should not need to adapt or silence their Indigenous identities to fit into academic culture. This caveat is explored further in McDowall's (2020) argument for use of "uncomfortable reflexivity" as a pedagogical tool in Indigenous studies, which suggests pedagogical focus be repositioned to challenge teachers' representation-making practices, instead of placing pedagogical aims solely on student transformation. Thus, to create a space for meaningful and enriching educational experiences for Indigenous students at university, it is important that limiting myths are challenged at a systemic level to create a space where institutional and societal transformation catalyses individual-level positive change. University leaders have a responsibility to decolonise and Indigenise their institutions, challenging the traditional logic of university itself to become more inclusive of multiple ways of knowing. Without institutional reform, the historical exclusion of Indigenous epistemologies means Indigenous people are right to be apprehensive about university's capacity to benefit them.

Given that university can disorient Aboriginal students' perceptions of their cultural identity, K-Track aimed to capitalise on the transformational potential in disorientation through exploration of expansive worldviews and malleable identity frameworks. By embracing diversity, intersectionality, paradox and pride in Indigenous and academic cultures, K-Track students were encouraged towards an ever-growing understanding of what being an Aboriginal person at university could mean for themselves, their families, their communities and, importantly, for academia — which cannot help but benefit from greater Indigenous representation across all disciplines and levels of the university. The next steps in understanding whether and how a transformational pedagogy might enhance Indigenous students' experiences in the transition to university are empirical. Future research is needed to (1) further explore the indicative correlations between the myth-busting pedagogy and transition and completion rates, expressed in this paper, (2) evaluate evidence of transformation amongst the bridging course students and (3) assess the relevance and applicability of different elements of TLT for Indigenous student cohorts.

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