

From access and participation to student success: A decade of research on building Indigenous academic self-efficacy to close the gap in higher education

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The gap in higher education outcomes between Indigenous and non-Indigenous Australians remains one of the nation's most persistent educational challenges. This paper reports findings from a decade-long research program comprising two phases. The first (2012–2016) identified 19 psychosocial and socio-emotional factors associated with academic persistence, revealing that the capabilities required for formal learning are acquired rather than innate. The second (2017–2022) tested an intervention model centred on building these capabilities. Longitudinal tracking of over 750 undergraduate students at a regional Australian university demonstrated significant improvements: subject pass rates increased from 64% to 82%, course completions doubled, and outcomes were sustained beyond the project period. Analysis revealed that tutoring effectiveness was conditional upon students having developed sufficient underlying capacity—a finding with implications for how institutions design support services.

Keywords: Indigenous higher education, academic self-efficacy, student support, psychosocial factors, academic performance, longitudinal study

Introduction

The gap in higher education outcomes between Indigenous and non-Indigenous Australians represents one of the nation's most enduring educational challenges. Despite decades of policy attention and substantial investment in equity programs, Indigenous students continue to experience lower rates of enrolment, progression and completion than their non-Indigenous peers. Cohort analyses (Figures 1, 2 & 3) consistently show less than 30% complete degrees in four years, around 42% complete in six years, and less than 50% of Indigenous students complete their degrees even after nine years (Department of Education, 2023), a pattern that has remained largely unchanged since the early-2000s. See the following Figures 1, 2, 3.

Figure 1 – Cohort analysis of Indigenous students in Bachelor courses over a 4-year period

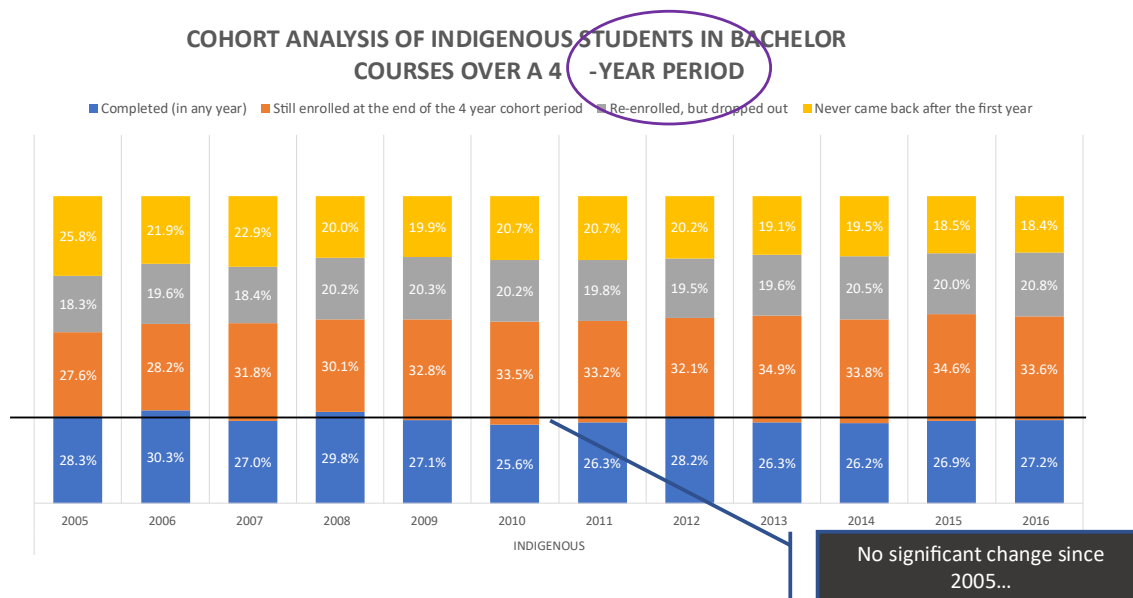


Figure 2 - Cohort analysis of Indigenous students in Bachelor courses over a 6-year period

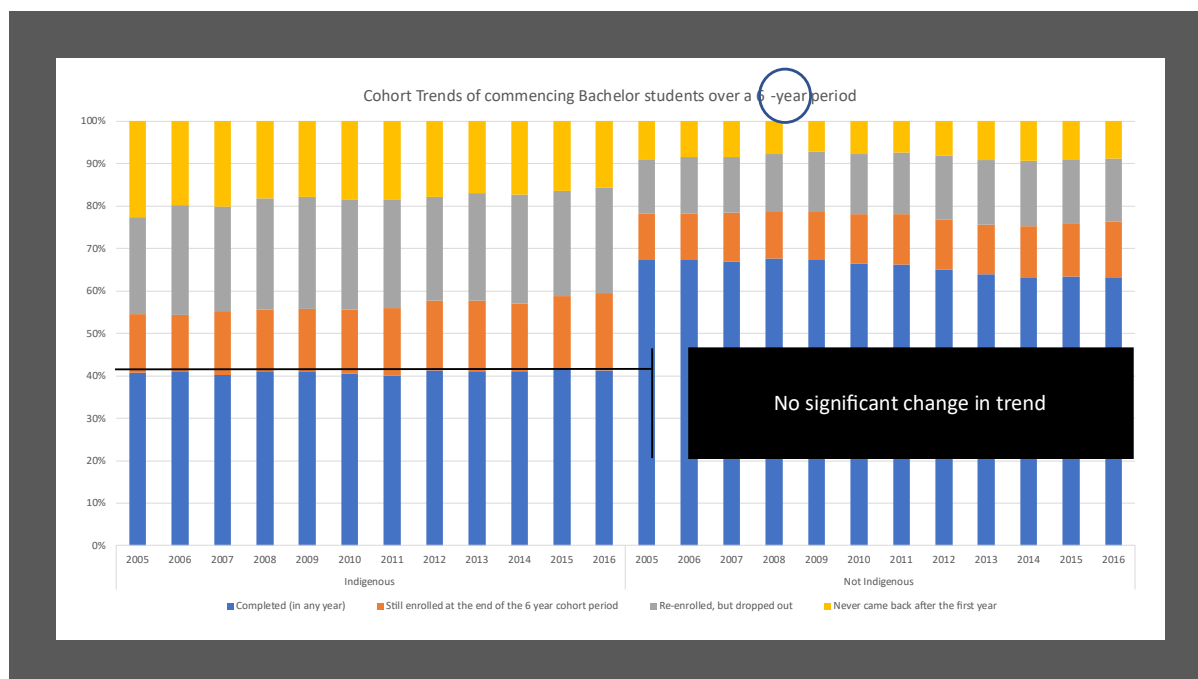
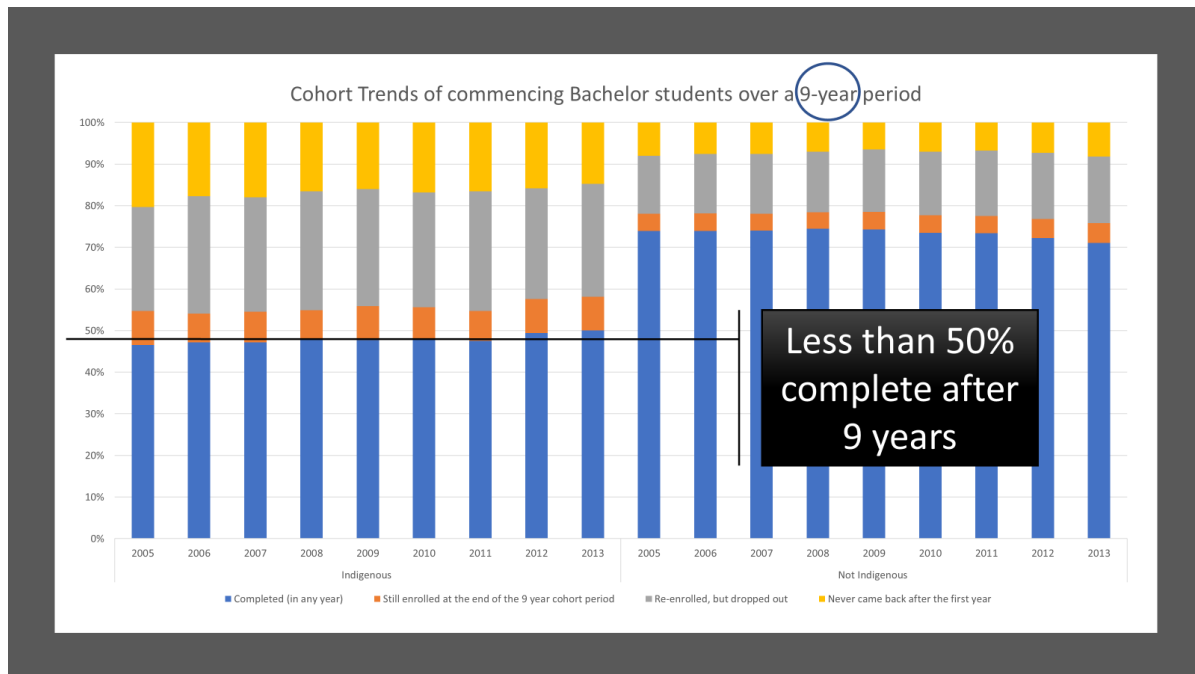


Figure 3 - Cohort analysis of Indigenous students in Bachelor courses over a 9-year period

Educational research and policy responses have predominantly focused on expanding participation through pathway programs, alternative admission criteria and financial support. While these initiatives have incrementally increased Indigenous enrolment, they have insufficiently addressed the complex factors affecting academic success once students are enrolled. The result has been what might be characterised as a revolving door: students enter higher education but too often leave without completing their qualifications and with a huge amount of debt. Improved access, in short, has not translated to improved outcomes.

When academic challenges have been identified, institutional responses have typically focused on modifying curriculum content to increase cultural relevance, adapting teaching approaches to accommodate presumed learning differences, or providing supplementary tutoring to address knowledge gaps. Yet the evidence above suggests that these interventions alone, while valuable, have proven insufficient for substantially improving completion rates (Nakata et al., 2008). This pattern raises fundamental questions about whether the field has correctly identified the factors that most strongly influence Indigenous student success – and whether alternative approaches might yield better results.

This paper presents findings from a decade-long research program designed to address these questions through two sequential projects. Moving beyond description and advocacy, the project team sought to generate empirical evidence for effective interventions that could measurably improve Indigenous student outcomes. The first project (2012–2016), funded through an Australian Research Council Discovery Indigenous Award, identified specific psychosocial and socio-emotional factors contributing to Indigenous student persistence and success in higher education. The second project (2017–2022)

implemented and tested an intervention model based on these factors to determine whether systematically building student capacity in these areas would lead to improved academic performance.

Self-efficacy and academic performance

The theoretical foundation for this research program draws primarily from social cognitive theory as developed by Bandura (1986, 1997, 2012), which posits that human behaviour is determined by a dynamic interplay between external social systems and internal self-influence factors. Within this framework, self-efficacy – defined as an individual's judgement of their capabilities to organise and execute courses of action required to achieve desired performances – emerges as a critical mediator of behaviour and achievement (Bandura, 1997; Schunk & Pajares, 2002).

In educational contexts, academic self-efficacy has consistently demonstrated strong positive correlations with academic performance across diverse settings and student populations (Richardson et al., 2012; Robbins et al., 2004). Meta-analyses have established that academic self-efficacy is one of the most robust predictors of academic achievement, often surpassing factors such as prior academic performance, standardised test scores and socioeconomic status in its predictive power (Honicke & Broadbent, 2016; Richardson et al., 2012).

However, the relationship between academic self-efficacy and performance is neither simple nor unidirectional. Pintrich and DeGroot (1990) found that self-efficacy influences academic performance through its effects on cognitive engagement, persistence and strategy use. More recent research has identified moderating factors including task difficulty, domain specificity and cultural context (Klassen, 2004; Usher & Pajares, 2008). Some researchers argue for a reciprocal relationship, where success builds self-efficacy, which in turn facilitates future success (Schunk & Pajares, 2002), while others have raised concerns about potential discrepancies between perceived and actual abilities (Vancouver & Kendall, 2006). This complexity underscores the need for nuanced approaches that address not merely self-efficacy beliefs themselves, but the constellation of factors that support or undermine their development.

Recent advances in self-regulated learning research have further expanded our understanding of how these processes operate. Schunk and Greene (2017) highlight that self-regulated learning involves complex interactions between cognitive, metacognitive, motivational and contextual factors that can vary significantly across cultural groups. Tanner (2012) suggests that metacognitive self-assessment practices can be particularly effective for supporting students' development of self-regulation skills, helping students become adaptive learners capable of troubleshooting problems and proposing innovative solutions. These contemporary perspectives reinforce the importance of considering both individual and socio-cultural processes when designing interventions to support academic success.

Indigenous student experience in higher education

Research on Indigenous student experiences in higher education has consistently identified multiple barriers to success, including academic under-preparation, challenges in navigating Western academic systems, financial constraints and socio-cultural factors (Behrendt et al., 2012; Page & Asmar, 2008). Yet much of this research has been characterised by what Malcolm and Rochecouste (2003) described as approaches that are "either broad brush (and therefore not concerned with the details) or based on the gathering of opinions or impressions... [There is] a serious lack of data on the ways in which Indigenous students in higher education perform... and the literature is overweighted with advice rather than

analysis" (p. 16). This observation, made over two decades ago, identified a gap in the research that has only partially been addressed in subsequent years.

Studies examining the academic issues faced by Indigenous students have identified several recurring clusters of challenges: under-preparedness for academic study, navigating course organisational structures, engaging with Indigenous content and knowledge within Western frameworks, adapting to teaching and learning expectations, and developing academic literacy skills for disciplinary conventions (Arbon & Nugent, 1994; Bourke et al., 1996; Burden et al., 1998; Sonn et al., 1996; Tennent et al., 1996; Usher et al., 2005). These findings have typically informed interventions focused on curriculum adaptation, Indigenous content inclusion, or alternative pedagogical approaches (Bourke et al., 1996; Page et al., 2007).

A smaller body of empirical research has examined specific aspects of Indigenous student learning, including approaches to learning (Robertson, 1996), conceptions of learning (Boulton-Lewis et al., 2001, 2003), aspirations (Craven et al., 2005), learning styles (Barnes, 2000), verbal reasoning (White, 1996) and critical thinking (Harrison, 2004). While valuable, these studies have typically focused on isolated aspects of learning rather than developing comprehensive models that address the full range of factors affecting student success.

Since 2015, research has expanded understanding of Indigenous student experience and success factors. Qualitative studies have documented student transformation at the cultural interface (Bennett et al., 2022; Hill et al., 2020, 2023), whilst research on enabling programs (Hodges et al., 2017) and higher degree by research pathways (Barney, 2018; Trudgett et al., 2016) has identified enabling conditions including quality supervision, culturally safe spaces, and community support. Sector-wide reviews continue to call for improved retention and completion (Universities Australia, 2023), and Pham et al. (2024) have recently proposed a Higher Education Success Factor model examining individual, social, and economic influences on completion. However, these studies typically report qualitative findings rather than quantitatively measured constructs, and intervention studies testing capability-building models remain scarce.

A related gap concerns the application of self-efficacy theory specifically to Indigenous higher education contexts. While the positive relationship between self-efficacy and academic performance is well established in general populations, questions remain about whether and how self-efficacy can be developed through targeted intervention with Indigenous students, and what specific factors might contribute to or constrain its development in these contexts. We found no peer-reviewed Australian higher education studies (2019–2025) that administer standard academic self-efficacy scales to Aboriginal and Torres Strait Islander undergraduates; contemporary Australian studies that quantify self-belief constructs tend to focus on school-level populations (e.g., Burns et al., 2023). In contrast, comparable higher education studies with Indigenous cohorts in North America have employed academic self-efficacy measures and linked efficacy to academic stress and persistence (Chee et al., 2019; Hoppa, 2012; Kristoff & Cottrell, 2021).

What remains notably absent from the literature, then, is longitudinal research that tracks the development of specific psychosocial and socio-emotional capacities in Indigenous students and examines their relationship to academic performance over time. Equally absent are intervention studies that test whether systematically building these capacities—including academic self-efficacy—produces measurable improvements in outcomes. Our research program was designed to address both of these gaps.

Project One: foundations of the research program

The foundations for this research program were established through an Australian Research Council Discovery Indigenous Award (IN120100021), funded from 2012 to 2016. This project emerged from some early collaborative work between the research team and the NSW Aboriginal Education and Training Directorate, aimed at improving Indigenous learning experiences and outcomes in tertiary education.

The research team comprised myself as Discovery Indigenous Award recipient and lead investigator, with Chief Investigators Professor Andrew Day (Deakin University) and Dr Gregory Martin (University of Technology Sydney), and Associate Researcher Ms Vicky Nakata. The team brought together multidisciplinary expertise spanning Indigenous education, curriculum studies, psychometric measurement, clinical psychology, adult and community education, and extensive fieldwork experience with Indigenous communities.

The study was motivated by a persistent gap in the research literature. Existing work had identified numerous factors affecting Indigenous student performance—under-preparedness, course organisation issues, teaching and learning styles, academic literacy challenges—yet much of this research offered description rather than analysis. There was limited empirical data on how Indigenous students actually experienced and navigated academic learning, what strategies they employed, and why some students persisted successfully whilst others did not.

The project posed four key research questions:

1. How do Indigenous students persist in academic learning engagements?
2. What aspects of learning enable or impede the actions to persist?
3. How are these aspects implicated in academic performance?
4. Are there significant patterns in persistence between non-Indigenous and Indigenous students?

Rather than focusing on changing curriculum content or teaching approaches, our conceptualisation suggested that we first needed deeper understanding of what Indigenous students were actually navigating in formal learning environments, and what capacities enabled some to navigate successfully.

Research design and methodology

The study employed a multiple cohort, multiple outcome (MCMO) cross-sequential design to longitudinally track the experiences of Indigenous and non-Indigenous students across five Australian universities from 2012 to 2016. This design enabled us to capture both the breadth of quantitative data and the depth of qualitative insights necessary to understand the multidimensional nature of academic persistence.

Participants

The study engaged Indigenous and non-Indigenous students enrolled in preparatory and undergraduate programs across the five participating institutions. Large sample sizes were planned at each site to address anticipated attrition over the multi-year study period. The key objective was to capture data on the nature and quality of learning engagements, the types of support sought by students, emerging strategies and skill development, learning behaviours and habits, and how individual students perceived and managed their own progress.

Key emphasis points were placed on three critical phases: early preparation work in schools and TAFE courses, first-year transition issues at university, and individual performance at the subject level in second year. Regular feedback to participants and sustained contact with study sites were key management strategies to maintain engagement over the three-year data collection period.

Data collection instruments

To capture the multidimensional nature of academic persistence and success, we employed five established psychometric instruments:

1. Motivation and Engagement Scale (MES; Martin, 2007): This 44-item scale assessed motivation and engagement across 11 factor-derived subscales, including three adaptive cognition subscales (self-efficacy, valuing school, mastery orientation), three adaptive behaviour subscales (planning, study management, persistence), three maladaptive cognition subscales (anxiety, failure avoidance, uncertain control), and two maladaptive behaviour subscales (self-handicapping, disengagement). An adapted version of the scale suitable for Indigenous students (Martin et al., 2008) was used, with reliability and validity assessed prior to analysis.
2. Goals Inventory (Roedel et al., 1994): This 25-item inventory assessed learning orientations relative to academic performance, including statements about attitudes and behaviours such as "I try even harder if I fail at something" and "It bothers me the whole day when I make a mistake." Students used a 5-point Likert scale to rate each statement, with separate scores calculated for learning and performance goals.
3. Working – Assessing Skills Habits and Style scale (W-SHS; Miles et al., 1996): This norm-referenced instrument assessed the learning attitudes of students undertaking further education in preparation for the workplace. It comprised 50 items addressing nine broad-based competencies associated with positive education-to-work transitions.
4. Learning and Study Strategies Inventory, second edition (LASSI; Weinstein et al., 2002): This inventory assessed students' awareness and use of learning and study strategies related to skill (information processing, selecting main ideas, test strategies), will (anxiety, attitude, motivation), and self-regulation (concentration, self-testing, study aids, time management). Each item used a 5-point Likert scale ranging from "not at all typical of me" to "very much typical of me."
5. School Wellbeing Profile (Konu & Lintonen, 2006): This 80-item instrument measured students' emotional wellbeing in the educational setting across four categories: school conditions, social relationships, means for self-fulfilment, and health status. Although originally intended for high school students, the Profile was appropriate for beginning TAFE and university students, with internal consistency ranging from 0.86 to 0.91 across categories.

Qualitative data collection

In addition to these quantitative measures, we conducted in-depth, semi-structured interviews with a subset of students drawn from each institutional context. Interviews were scheduled twice yearly to capture data representative of the academic year and to explore developing strategies over time. Students were asked about their early formative learning experiences, the types of support they sought from teachers and institutions, emerging strategies and skill development, learning behaviours and habits, and how they perceived and managed their own progress. To contextualise these responses, students

were also asked about preparation work experienced at TAFE and transition issues before and after coming to university.

The continuity with the cohort served two purposes. First, it enabled researchers to build rapport and for individuals to build confidence over time, establishing a safe environment for both Indigenous and non-Indigenous students to fully express aspects of their learning experience. Previous research (Harrison, 2004a) indicates this is a key factor in producing rich, ecologically valid research data with Indigenous students. Second, the longitudinal design enabled exploration of developing strategies and changing experiences across the student journey.

Analytical approach: Understanding entanglement and navigation

A key challenge in analysing data on Indigenous student experience is avoiding two equally unhelpful framings: deficit accounts that position Indigenous students as lacking capacities for academic success, and romanticised accounts that overlook the genuine difficulties students face. We needed an analytical approach that could capture the complexity of what students were actually navigating—the multiple, often competing demands on their attention and energy—whilst recognising the agency and resourcefulness they brought to that navigation.

The concept of the Cultural Interface (Nakata, 2007a, 2007b) provided a useful framework for this purpose. Rather than treating formal learning environments as neutral spaces or as sites of cultural mismatch, this framework recognises higher education as a terrain where different knowledge systems, institutional demands, community obligations, and personal aspirations intersect and sometimes pull in different directions. Students at this interface are not simply learning content; they are navigating entanglements—between academic expectations and family responsibilities, between disciplinary knowledge and Indigenous ways of knowing, between individual achievement and collective obligation, between institutional processes and the rhythms of community life.

This framing proved particularly useful for interpreting qualitative data. It directed analytical attention to three dimensions of student experience: the constellation of demands students were navigating at any given time, the tensions that constrained or complicated their responses, and the strategies and agencies students deployed to manage these entanglements. Rather than asking simply “what barriers do students face?” we asked “what are students navigating, and how?”

Quantitative analysis employed comparative statistical methods (t-tests, ANOVAs) to identify differences between Indigenous and non-Indigenous students, with hierarchical multiple regression used to determine which factors most strongly predicted academic performance. Qualitative and quantitative findings were then synthesised to develop an integrated understanding of what enabled or impeded student persistence.

Findings: What students were navigating

The data revealed that Indigenous students were navigating far more than academic content challenges. They were managing a complex web of demands spanning practical, institutional, social, and deeply personal domains—often simultaneously, and often without adequate support or recognition of this invisible labour.

Transition: Establishing a foothold

Students reported significant struggles in the transition to higher education. These encompassed practical challenges – managing finances, securing accommodation, living away from home for the first time, balancing part-time work with study, navigating public transport and daily travel times – as well as institutional challenges such as understanding enrolment processes, finding classes and tutorial rooms, deciphering timetables, and working out who to ask for help.

These were not minor inconveniences. For many students, particularly those from regional, remote, or low socioeconomic backgrounds, the transition period consumed enormous cognitive and emotional resources. Students described feeling overwhelmed, disoriented, and unsure whether they belonged. The practical demands of establishing a life in a new place competed directly with the academic demands of engaging with their studies. Many students reported that they struggled to settle into their studies because so much energy was going into simply surviving the transition.

Imposter syndrome: The hidden struggle

Perhaps the most striking finding from the qualitative data concerned the prevalence of what we came to understand as imposter syndrome among Indigenous students. Students reported persistent self-doubt, low self-belief, and a pervasive fear of being ‘found out’ as not belonging in higher education. They described attributing their achievements to luck rather than ability, investing heavily in what others thought of them, fearing failure, and worrying that their presence in university was somehow a mistake that would eventually be discovered.

These experiences were remarkably consistent across the cohort, yet they remained largely invisible to the institution. Students reported that they would not talk about these fears with support staff. When asked how they were going, they would say everything was fine. The shame and vulnerability associated with these feelings created a barrier to help-seeking precisely among those students who most needed support.

This finding had profound implications for how institutions might identify and support struggling students. Traditional approaches that rely on students to self-identify difficulties and seek help were likely missing those experiencing the deepest struggles. The students most in need of support were often the least likely to ask for it.

The breadth of factors

Through integrated analysis of quantitative and qualitative data, we identified a wide range of psychosocial and socio-emotional factors affecting students’ capacity to persist and succeed:

- Independent learning and the development as independent learners
- Student readiness and under-preparation for academic learning
- Student agency and self-determination
- Self-efficacy and academic self-efficacy
- Self-regulation and self-management
- Persistence and effort
- Motivation and goal orientation

- Student engagement with learning
- Organisation and study behaviours
- Sense of belonging and connection
- Navigating Indigenous knowledge and perspectives within academic learning
- Resilience and capacity to recover from setbacks
- Managing the transition to higher education
- Health and socio-emotional wellbeing
- Managing finances, accommodation, employment, and daily logistics

These factors did not operate in isolation. Challenges in one domain frequently affected capacity in others. Financial stress reduced time available for study, which undermined organisation and study behaviours, which eroded self-efficacy and persistence. Social isolation diminished sense of belonging, which reduced engagement, which affected motivation. The factors were entangled – and students were navigating these entanglements constantly.

Similarity across student populations

One of the most significant findings was the remarkable similarity in the fundamental learning challenges faced by Indigenous and non-Indigenous students. Statistical comparisons across the psychometric instruments revealed no significant differences in the types of challenges encountered, though variation existed in their intensity and specific manifestations.

This finding challenged deficit narratives that attribute Indigenous academic underperformance primarily to cultural differences or presumed learning style variations. The data indicated that barriers to success were more closely related to academic preparation, resource availability, psychosocial factors, and the capacity to navigate institutional demands – challenges that affected students across populations.

What differed was not the nature of the challenges but the context in which they were navigated. Indigenous students were more likely to be first-in-family to attend university, more likely to come from regional or remote areas, more likely to face financial constraints, and more likely to carry responsibilities to family and community alongside their studies. They were navigating similar challenges but often with fewer resources and less institutional recognition of their circumstances.

How students navigated

The data also revealed the strategies and agencies students employed in navigating these entanglements. Students were not passive in the face of difficulty. They sought support when they felt safe to do so. They developed study routines and organisational systems. They drew on family and community as sources of motivation and accountability. They found ways to connect academic learning to their aspirations for contributing to their communities. They persisted through setbacks, adjusted their strategies, and learned from experience.

Yet agency alone was often insufficient. Students with strong motivation sometimes lacked the study behaviours to translate intention into action. Students with clear goals sometimes lacked the self-regulatory skills to manage competing demands effectively. Students who wanted to seek help sometimes lacked the confidence to do so, or did not know what support was available or how to access it. The capacities required for successful navigation were multiple and interrelated – and many students arrived at university without having had adequate opportunity to develop them.

The three key factors: A framework for intervention

Synthesis of the findings revealed that the numerous psychosocial and socio-emotional factors identified could be understood through three overarching dimensions that most strongly affected progression and completion:

1. **Student capacity (under-preparation):** This encompassed not merely academic knowledge gaps but the broader capabilities required for successful higher education engagement – self-regulation, organisation, study behaviours, help-seeking, persistence, and the self-efficacy to deploy these capabilities effectively under pressure. Many students arrived under-prepared not because they lacked intelligence or motivation but because they had not had opportunity to develop these specific capacities.
2. **Student finance (time-on-task):** Financial pressures emerged as a pervasive influence affecting students' capacity to devote sufficient time and cognitive resources to their studies. Students juggling work commitments, managing accommodation instability, or experiencing ongoing financial stress had diminished capacity for the sustained engagement that academic success requires. Finance was not merely a material concern but a factor that shaped how much of themselves students could bring to their studies.
3. **Student support (psychosocial and socio-emotional):** The quality and accessibility of support significantly influenced students' capacity to navigate challenges. This encompassed formal institutional support but also the broader psychosocial and socio-emotional dimensions of the student experience – belonging, connection, recognition, and the confidence to seek help when needed. The prevalence of imposter syndrome and reluctance to disclose struggles indicated that existing support structures were not reaching many students who needed them.

These three factors provided a framework that organised the complexity of our findings into actionable domains. Rather than attempting to address dozens of individual factors, institutions could structure support around these three pillars, with each pillar encompassing multiple related elements.

The key revelation: Learning to learn in formal environments

Amidst the complexity of factors identified, one finding emerged that fundamentally reframed our understanding of Indigenous student success – and indeed, student success more broadly.

Throughout the study, we had operated with an implicit assumption shared across the higher education sector: that students arrive at university with at least some natural capacity for learning in formal educational environments. The task of the institution, in this view, is to transmit knowledge and assess its acquisition – not to teach students how to learn.

Our data challenged this assumption directly. Universities are not natural places. They are artificial environments, designed historically to develop knowledge and skills for future workforce participation.

The patterns of intellectual behaviour required for success in such environments—sustained independent study, self-regulated learning, time management, help-seeking, reflective practice, the capacity to defer gratification and persist through difficulty—are not innate human capacities. They are culturally specific skills that must be acquired.

Some students arrive at university having already developed these behaviours and dispositions through prior educational experiences, family modelling, or other opportunities. But not all students come with these capacities—and there is no reason they should. These are learned capabilities, not natural endowments.

Yet universities do not typically focus on developing these qualities. The assumption that students either possess them or will somehow acquire them through immersion pervades institutional practice. Curriculum focuses on disciplinary content. Assessment measures knowledge acquisition. Support services respond to crisis. What is largely absent is systematic attention to building the learner identity itself—helping students develop the dispositions, strategies, and skills required for learning in formal environments, and providing opportunities for students to learn how to use those dispositions effectively.

This insight illuminated why so many students struggled despite adequate intelligence and genuine motivation. They were being asked to perform in an environment that required specific learned capabilities they had not had the opportunity to develop. Their difficulties were not deficits in ability but gaps in preparation for an artificial environment with particular, historically-constructed demands.

The finding also explained the similarity we observed between Indigenous and non-Indigenous students. Neither group automatically possesses the capabilities required for formal learning. Students from backgrounds where these dispositions were explicitly developed—through schooling, family practices, or other means—arrived better prepared. Students without such preparation, regardless of cultural background, faced similar challenges in navigating an environment that assumed capacities they had not yet acquired.

Building the learner identity

This revelation pointed toward a fundamentally different approach to student support. If the capabilities required for formal learning are acquired rather than innate, then institutions have a responsibility to help students acquire them. This means:

- Recognising that learning to learn in a formal environment is itself a crucial developmental step—one that creates the right disposition and growth mindset for engaging with higher education
- Understanding that developing these capacities can lead to academic persistence, self-control, curiosity, self-determination, self-confidence, and self-regulation—the very factors our study identified as critical for success
- Accepting institutional responsibility for helping students develop the capacities, strategies, and skills required, and providing opportunities for students to learn how to deploy them effectively

Building the learner identity means enabling students to see and understand themselves as learners. This begins with helping students recognise how their actions, motives, emotions, and thoughts about themselves in the learning environment are interconnected and affect their everyday experiences. It

requires regular engagement that elicits students' perspectives on their own learning, prompting reflection on learning processes and experiences.

Critically, it means providing opportunities for students to acquire the language and vocabulary for talking and thinking about how they are going about their learning—enabling them to view and express themselves as learners. This develops awareness of learner ownership, agency, and responsibility, and embeds practices of self-reflection, self-assessment, and self-evaluation.

This was the key insight that shaped our intervention model. Rather than treating student support as remediation for individual deficits, we reconceptualised it as capability-building—systematically developing the learner identity and the capacities required for successful navigation of formal learning environments. The three pillars (student capacity, student finance, student support) provided the framework; the goal was building the learner.

Towards a model of Indigenous student support

The findings from Project One fundamentally reframed our understanding of what Indigenous student success requires. Academic self-efficacy was not simply a matter of confidence or positive self-belief. It emerged from a constellation of interrelated capacities—capacities that enabled students to navigate the entanglements of higher education whilst maintaining their sense of identity and purpose.

This insight led to a new conceptual model positioning academic self-efficacy as an emergent property arising from capability development:

Capabilities of the learner → Academic persistence → Academic self-efficacy → Academic performance

The model suggested that effective intervention should focus on systematically building the capabilities that enable students to engage productively with academic demands—not by attempting to eliminate the complexity of what students navigate, but by equipping them to navigate it more successfully. The three pillars—student capacity, student finance, and student support—provided the architecture around which such capability-building could be organised.

The finding that Indigenous and non-Indigenous students faced similar fundamental challenges further suggested that effective interventions need not be premised on cultural difference. Building universal learning capacities (whilst acknowledging the specific contextual factors shaping Indigenous students' experiences) offered a path forward that respected student agency and avoided deficit framings.

These insights from Project One formed the foundation for the intervention model tested in Project Two (2017–2022), which sought to determine whether systematically developing student capabilities across the three pillars would produce measurable improvements in academic outcomes.

Project Two: implementing and testing the model (2017–2022)

The insights from Project One posed a clear challenge: if the capabilities required for formal learning are acquired rather than innate, and if universities do not typically focus on developing these capacities, then what would happen if an institution deliberately set out to build them? Would systematically developing the learner identity and the dispositions for formal learning produce measurable improvements in academic outcomes?

Project Two was designed to answer this question. Where Project One was exploratory and diagnostic, Project Two was interventional and evaluative. Rather than examining what factors predict success, we tested whether systematically cultivating those factors would produce the improvements our theoretical model predicted.

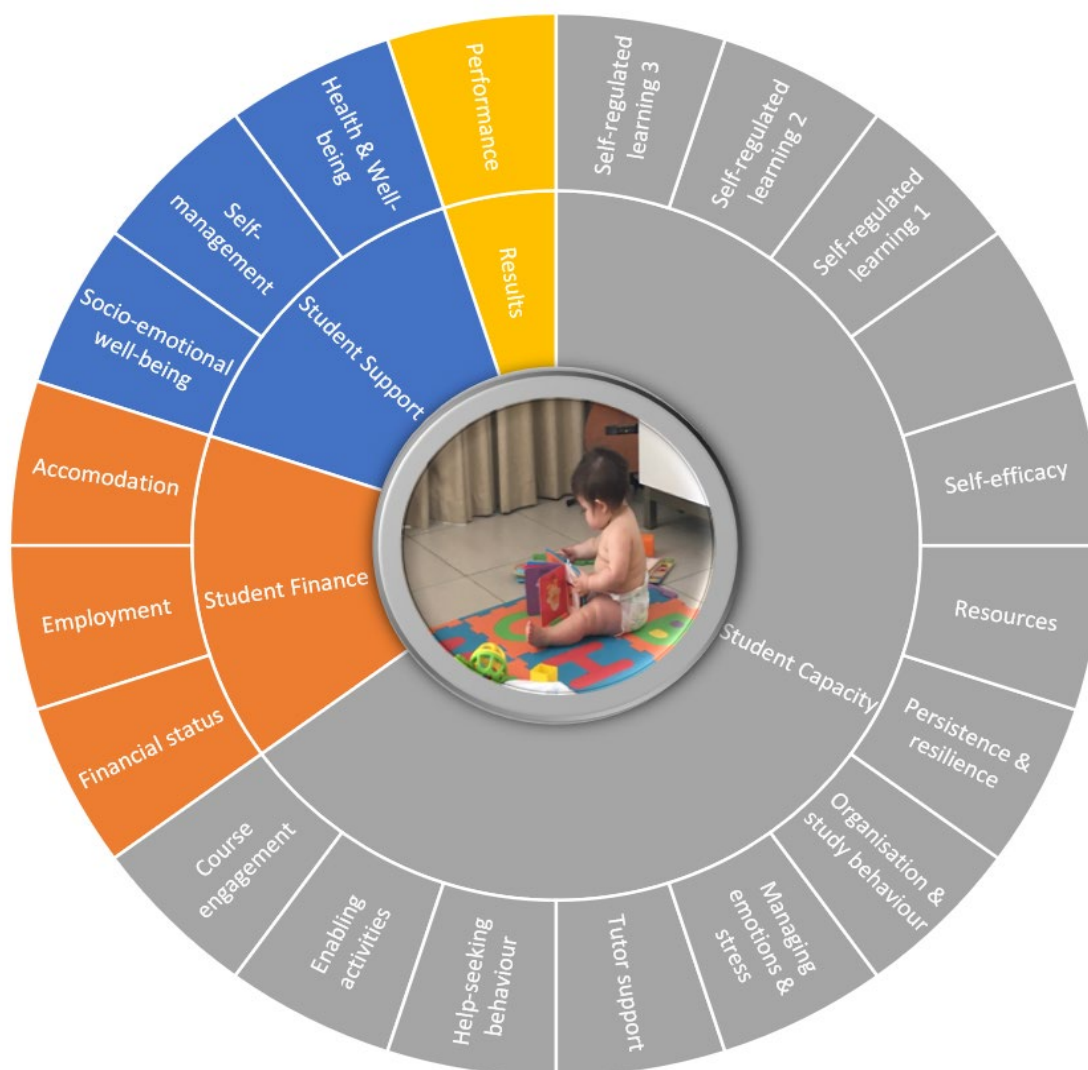
Importantly, our approach diverged from traditional interventions that typically modify curriculum content, teaching methods, or assessment practices. Those approaches address important dimensions of the student experience, but they do not directly target the acquired capabilities that enable students to engage productively with whatever curriculum and teaching they encounter. Research across diverse international contexts has consistently demonstrated a positive correlation between self-efficacy and academic performance (Honicke & Broadbent, 2016; Richardson et al., 2012; Robbins et al., 2004). We deliberately held curriculum, teaching, and assessment constant in order to test a specific theoretical proposition: that systematically building academic self-efficacy and the capabilities that underpin it can improve academic outcomes independently of changes to academic content or delivery. This design choice was directly informed by our finding from Project One that Indigenous and non-Indigenous students face similar fundamental challenges in navigating formal learning environments—challenges rooted in preparation and capability rather than curriculum content.

The intervention framework

The intervention model operationalised the insights from Project One through a structured framework centred on building academic self-efficacy. The three pillars identified in Project One—student capacity, student finance, and student support—provided the architecture for the intervention, with each pillar encompassing specific elements that could be systematically addressed.

The intervention framework was operationalised through the IERC Model of Learning Support Services (See Figure 4 below), which visualises how the three pillars identified in Project One structure comprehensive student support.

Figure 4 – IERC Learning Support Model



The model places the learner at the centre, surrounded by three interconnected domains: **Student Support** (shown in blue) encompasses health and wellbeing, self-management, and socio-emotional wellbeing—the pastoral factors that affect students’ capacity to engage with their studies. **Student Finance** (shown in orange) addresses accommodation, employment, and financial status—the material conditions that enable or constrain sustained engagement with learning. **Student Capacity** (shown in grey) encompasses the academic capabilities required for formal learning: self-regulated learning (across its three phases), self-efficacy, resources, persistence and resilience, organisation and study behaviour, managing emotions and stress, tutor support, help-seeking behaviour, enabling activities, and course engagement. The outer ring leads to **Performance** (results), reflecting the model’s core proposition: that building capabilities across these three domains enables academic persistence, which develops academic self-efficacy, which in turn produces improved academic performance.

This integrated model guided the design of our support services, the training of staff, the structure of student engagements, and the monitoring of student progress throughout the intervention.

Building the learner identity

Central to the intervention was the deliberate cultivation of the learner identity, following the work of MacFarlane (2018). This meant helping students to see and understand themselves as learners—to develop awareness of how their actions, motives, emotions, and thoughts about themselves in the learning environment are interconnected and affect their everyday experiences.

The intervention provided regular opportunities for students to acquire language and vocabulary for talking and thinking about how they were approaching their learning. Through structured conversations with trained staff, students were prompted to reflect on their learning processes and experiences, to articulate challenges they were facing, and to consider strategies for addressing them. This was not counselling or remediation; it was capability-building—developing the metacognitive awareness and self-regulatory skills that formal learning requires.

The goal was to foster learner ownership, agency, and responsibility: to embed practices of self-reflection, self-assessment, and self-evaluation that would enable students to monitor and adjust their own learning strategies. Over time, this would develop the dispositions that lead to academic persistence, self-control, curiosity, self-determination, self-confidence, and self-regulation—the very capacities our research had identified as critical for success.

The 19 factors operationalised

The 19 psychosocial and socio-emotional factors identified in Project One were organised into four domains that structured the intervention: **Transition factors** addressed students' movement into and navigation of the higher education environment: help-seeking behaviour, managing emotions and stress, organisation and study behaviours, growth mindset, subject engagement, and persistence and resilience. **Academic factors** addressed cognitive and metacognitive engagement with learning: learning disposition, intellectual behaviours, self-efficacy, self-motivation, and the three phases of self-regulated learning (planning, execution, and reflection). **Pastoral factors** addressed personal and social wellbeing: health and wellbeing, self-management, and socio-emotional wellbeing. **Support factors** addressed external resources and assistance: tutor support, remedial activities, and access to resources. Each factor was operationalised through a TAPS strategy with specific questions, prompts, and support strategies that staff used in their engagements with students. This created a comprehensive framework for our engagement with students to address the full complexity of what students were navigating, rather than focusing narrowly on academic content or skills.

Project design and methodology

Project Two employed a longitudinal implementation design spanning five years (2017–2022), conducted at two campuses of a regional Australian university following a formal restructuring of the Indigenous centre. The implementation constituted a key element of the institution's refreshed Indigenous education strategy.

Participants

The study engaged over 750 Indigenous undergraduate students enrolled across approximately 105 different courses, representing diverse educational backgrounds, geographic origins, and levels of academic preparation. The cohort comprised both full-time (70%) and part-time (30%) students, with varying entry pathways including direct school-leavers, mature-age entrants, and pathway program graduates.

Unlike experimental designs with separate treatment and control groups, we utilised a longitudinal comparative approach, benchmarking outcomes against historical data (2010–2016) from the same institution. This approach enabled implementation at scale and ensured all students received support, rather than withholding it from some to establish a control group.

The structured engagement model

Implementation focused on building student capacity through systematic engagement at critical points throughout the two traditional semesters of the academic year. Trained staff conducted structured conversations with students at four key touch points each semester – weeks 3, 6, 9, and the final week – addressing the transition, academic, pastoral, and support domains.

These engagement points served multiple functions: establishing rapport, monitoring progress, identifying emerging challenges, providing targeted guidance and tutor support, and –critically– building student self-awareness of their own learning processes. The conversations were designed not merely to check on students but to develop their capacity to reflect on and articulate their learning experiences.

A distinctive feature of the intervention was its technology-enabled monitoring system, provided by the WillowSoft Indigenous Student Success Platform (WillowSoft, n.d.), which allowed students to provide real-time feedback at each touch point via computer or mobile devices. This continuous data collection facilitated rapid responses to emerging challenges and created a rich longitudinal dataset on student experiences.

The model incorporated differentiated support intensities based on identified risk factors, with particular attention to students enrolled in high-risk subjects identified through historical analysis. Tutor support was allocated strategically, informed by our emerging understanding of the relationship between tutoring effectiveness and student capacity.

In many respects, this approach represented an early, human-delivered form of what is now termed hyper-personalisation (tailoring support to individual student needs, circumstances, and developmental trajectories). Advances in artificial intelligence and learning analytics are now enabling such approaches to operate at greater scale and with finer granularity (Bhutoria, 2022), but the foundational insight remains the same: effective support must respond to the individual learner, not merely deliver standardised interventions (Kucirkova & Leaton-Gray, 2023).

Data collection

Data collection encompassed multiple dimensions to capture both academic outcomes and the development of psychosocial capacities. Academic performance metrics—subject pass rates, grade distributions, retention rates, and course completions—were extracted from institutional records systems. The 19 factors were assessed through the learner capability instrument aligned with our theoretical framework. Additional data sources included tutor reports, engagement records, and feedback from support staff.

Analytical approach

The analytical approach combined longitudinal trend analysis, comparative statistics, and multilevel modelling to account for the nested nature of the data (students within courses within faculties). Of particular methodological significance was a three-dimensional analysis technique devised by the WillowSoft team to examine the interaction between tutoring hours, academic capacity, and academic

outcomes. This approach, using Lowess surface fit polynomial modelling, enabled us to move beyond simple correlations to understand complex interaction effects between intervention components and student characteristics.

Baseline: Historical context

Analysis of institutional data from 2010–2016 (pre-intervention) established the baseline against which outcomes would be measured. Indigenous student academic performance during this period showed an average subject pass rate of 64.2% (SD = 5.8%), with substantial year-to-year variation, particularly in first-year subjects where pass rates ranged from 50% to 77%.

Granular examination identified 11 specific subjects (representing 0.8% of all subjects offered) that accounted for approximately 20% of all student failures between 2015 and 2019. These high-risk subjects were concentrated in first-year core requirements across the Diploma of Higher Education, Bachelor of Nursing Science, Bachelor of Education (Primary), and Bachelor of Business. The clustering of failures within this small subset of subjects presented both a challenge and an opportunity: these subjects became focal points for measuring intervention effectiveness and targets for strategic support allocation.

Historical data also revealed patterns in student progression. Prior to the intervention, approximately 23% of first-year students, 31% of second-year students, and 24% of third-year students moved to “on a break” status (effectively withdrawing temporarily or permanently). Second-year students appeared particularly vulnerable to attrition.

Findings: Academic outcomes

The intervention produced substantial improvements across multiple measures of academic performance.

Subject pass rates - Subject pass rates increased from the pre-intervention average of 64.2% to 75% in the initial implementation years (2017–2022), representing an improvement of approximately 10 percentage points. This improvement was sustained and continued beyond the formal project period, reaching 81% by 2024—a 17% improvement from baseline. This improvement trend is projected to close the gap between Indigenous and non-Indigenous students in 2026.

Course completions - Course completions at the institution increased from 73 in 2016 (pre-intervention) to 147 in 2020 (post-intervention), representing a 101% increase. This positioned the institution in that year as having the fourth-highest Indigenous course completion rate among Australian universities in 2020.

Retention - The percentage of first-year students transitioning to “on a break” status decreased from 23% pre-intervention to 18% by 2024, indicating improved early retention.

Performance gaps - The intervention demonstrated impact on closing performance gaps between Indigenous and non-Indigenous students. In high-risk subjects, the Indigenous performance gap decreased substantially—from 14.5% in 2016 to 8% in 2019 in one category of subjects, and from 12% to 7% in another. Analysis of grade distributions showed that not only were more Indigenous students passing, but the distribution of higher grades also improved, suggesting the intervention supported not just minimal achievement but higher levels of academic performance.

COVID-19 resilience - The intervention's impact on retention was particularly evident during the COVID-19 pandemic period of 2020. While an initial decrease in first-year student numbers was observed during the early pandemic period, student numbers rebounded to near-2019 levels. Second- and third-year enrolment patterns in 2020 closely mirrored 2019 trends, suggesting the intervention provided sufficient support to maintain normal retention patterns despite significant external disruption.

Notably, the first-year students who experienced the sharpest initial decline were those newest to the intervention, having not yet had opportunity to develop the capabilities that enabled persistence through disruption. Their subsequent recovery—and the stability of second- and third-year cohorts who had already engaged with the learner identity model—suggests that these capabilities, once developed, provide genuine resilience against external shocks. WillowSoft captured these enrolment trends in its dataset (See Figures 5, 6, 7):

Figure 5 – First Year enrolments in 2020

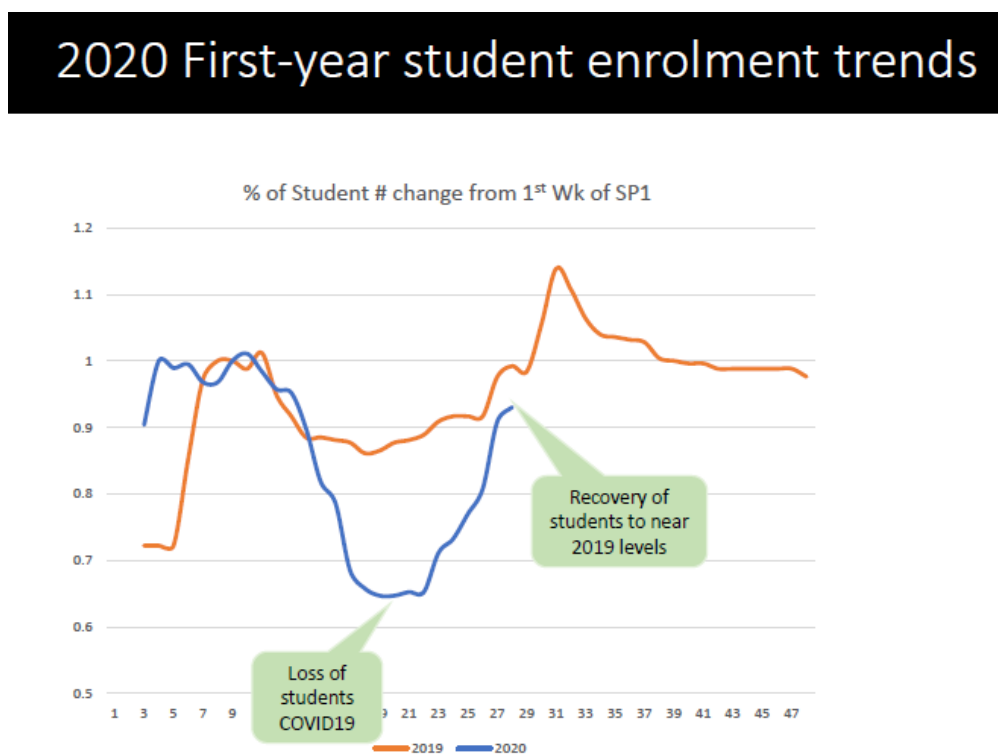


Figure 6 – Second Year enrolments in 2020

2020 Second-year student enrolment trends

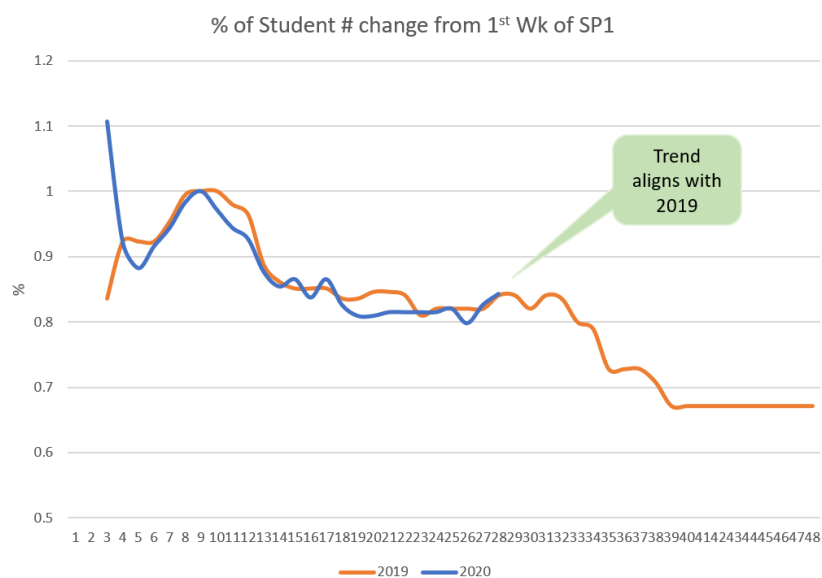
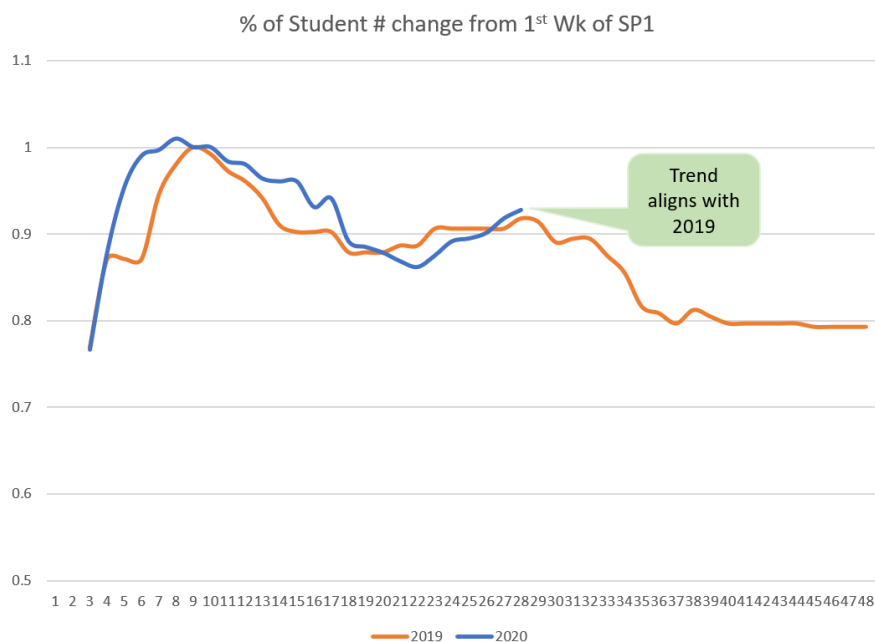


Figure 7 – Third Year enrolments in 2020

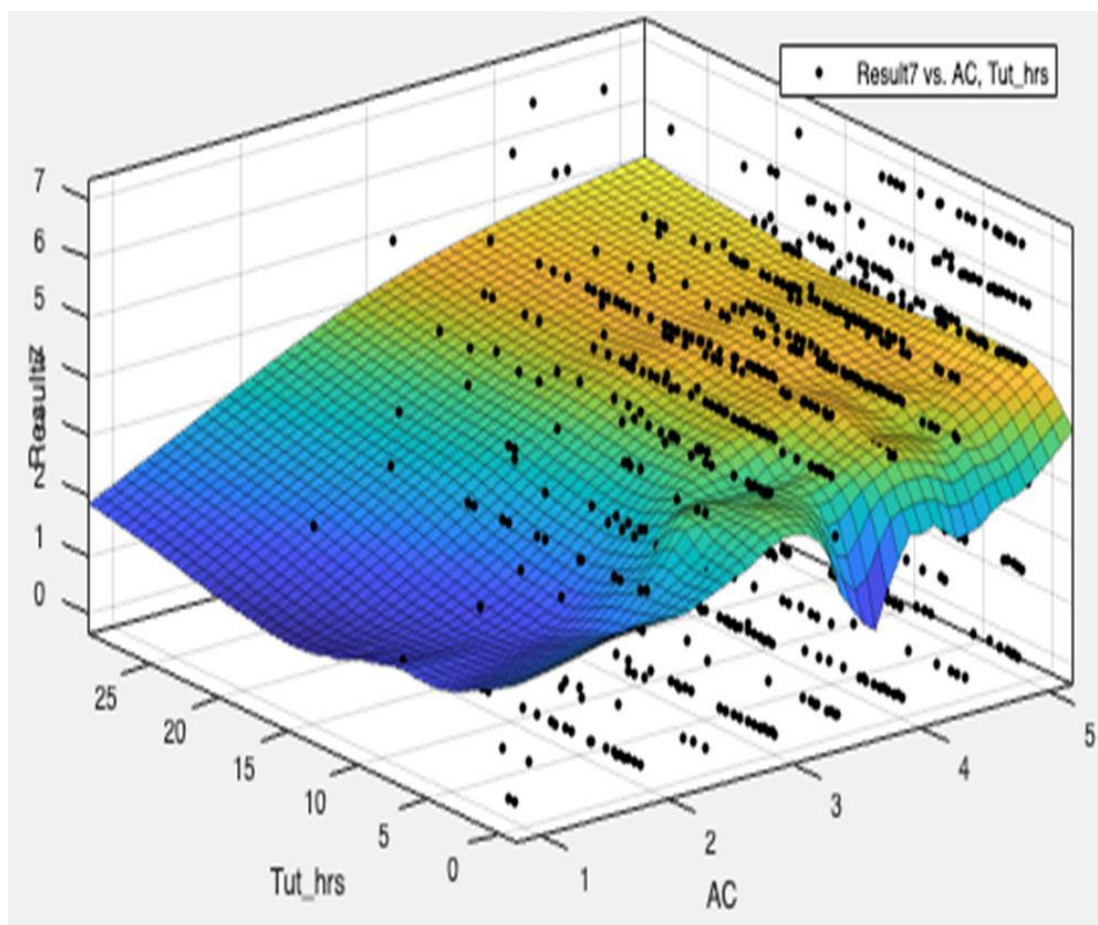
2020 Third-year student enrolment trends



Findings: The relationship between tutoring and capacity

A methodologically innovative aspect of our analysis was WillowSoft's three-dimensional examination of the relationship between tutoring hours, academic capacity, and academic outcomes. Initial bivariate analysis suggested modest differences in grade distribution between tutored and non-tutored students, with tutored students showing slightly better outcomes but still experiencing substantial failure rates. This counterintuitive finding—given widespread assumptions that tutoring universally benefits academic performance—prompted more sophisticated analysis.

Figure 8 - X axis, AC = Organisation and study behaviours & Course engagement; Y axis, Tut_hrs = Tutor hours for each subject; Z axis, Result 7 = Subject GPA



The three-dimensional model (Figure 8) revealed a complex, non-linear relationship between these variables that would have been obscured by traditional bivariate analyses. Three critical patterns emerged:

First, students with low academic capacity scores (averaging 2 on a 5-point scale for organisation, study behaviours, and course engagement) showed minimal benefit from tutoring, even with up to 20 hours per subject per semester, and continued to fail subjects at high rates. The surface plot showed a relatively flat plane near the origin, indicating that increased tutoring for students with lower capacity scores produced minimal grade improvements.

Figure 9 - Tutoring hours, academic capacity and grade outcomes – Lower capacity**Example 1 – Lower capacity**

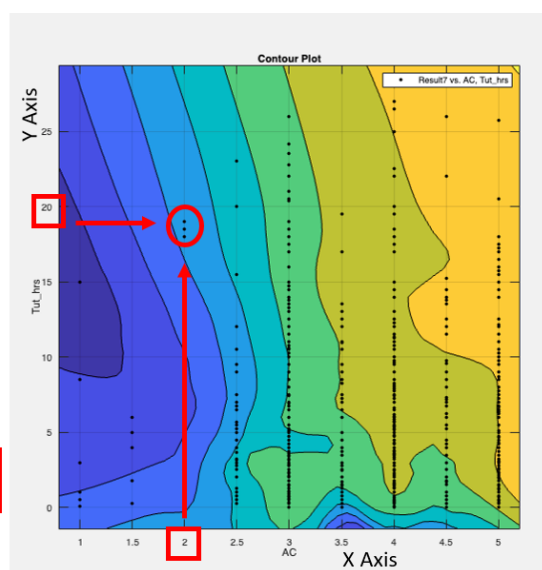
Students have 20 hrs of tutoring per subject, but scores an average of 2 for Organisation & Study behaviour & Course Engagement. These students still fail these subjects.

Organisation & study behaviour

Tutor Feedback	
5 It's all good and I'm quite independent The student uses study plans and strategies effectively to keep on top of study demands, and requires minimal support.	edit
4 It's going well and I'm more independent The student has good study plans and learning strategies and is able to be more specific about their tutoring needs.	edit
3 It's going OK but I still need help The student is benefiting from tutoring advice, using study plans and learning strategies effectively to keep on top of study demands, but continues to need support.	edit
2 It's difficult but I am getting help The student is responding to tutoring advice and learning to develop strategies to keep on top of study demands but is still having difficulties.	edit
1 It's not working out and I'm not getting help The student is disorganised, attends irregularly, does not respond to advice, and is not getting the benefits of tutoring.	edit

Course Engagement

Tutor Feedback	
5 It's all good and I'm quite independent The student engages well with the course content and actively directing tutoring support to deepen specific knowledge and skills.	edit
4 It's going well and I'm more independent The student mostly engages well with course content and is growing in independence.	edit
3 It's going OK but I still need help The student is improving their engagement with course content but still dependent on tutoring support.	edit
2 It's difficult but I am getting help The student is struggling with their course and is highly dependent on tutoring support.	edit
1 It's not working out and I'm not getting help The student is not doing so well in their course and not benefiting from tutoring support.	edit



Second, students with high academic capacity scores (averaging 4 on the same scale) showed substantial benefits from tutoring, achieving pass to credit grades with similar tutoring hours. The surface plot revealed a steep incline in the high-capacity region, indicating that tutoring hours translated efficiently into improved grades for these students.

Figure 10 - Tutoring hours, academic capacity and grade outcomes – Higher capacity**Example 2 – Higher capacity**

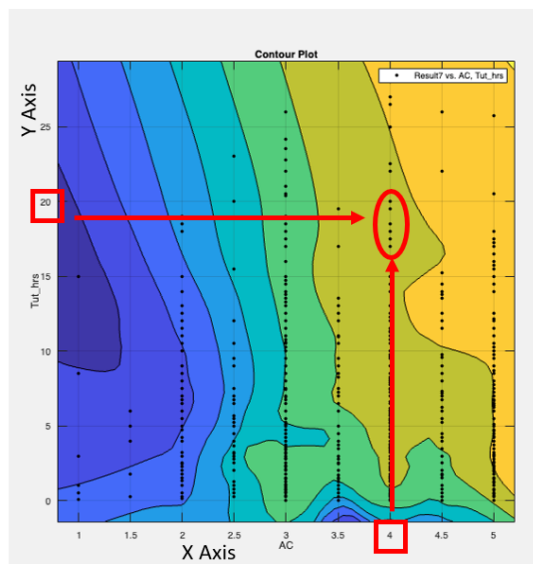
Students have 20 hrs of tutoring per subject but scores an average of 4 for Organisation & Study behaviour, Course Engagement. These students still receive passes & credits for these subjects.

Organisation & study behaviour

Tutor Feedback	
5 It's all good and I'm quite independent The student uses study plans and strategies effectively to keep on top of study demands, and requires minimal support.	edit
4 It's going well and I'm more independent The student has good study plans and learning strategies and is able to be more specific about their tutoring needs.	edit
3 It's going OK but I still need help The student is benefiting from tutoring advice, using study plans and learning strategies effectively to keep on top of study demands, but continues to need support.	edit
2 It's difficult but I am getting help The student is responding to tutoring advice and learning to develop strategies to keep on top of study demands but is still having difficulties.	edit
1 It's not working out and I'm not getting help The student is disorganised, attends irregularly, does not respond to advice, and is not getting the benefits of tutoring.	edit

Course Engagement

Tutor Feedback	
5 It's all good and I'm quite independent The student engages well with the course content and actively directing tutoring support to deepen specific knowledge and skills.	edit
4 It's going well and I'm more independent The student mostly engages well with course content and is growing in independence.	edit
3 It's going OK but I still need help The student is improving their engagement with course content but still dependent on tutoring support.	edit
2 It's difficult but I am getting help The student is struggling with their course and is highly dependent on tutoring support.	edit
1 It's not working out and I'm not getting help The student is not doing so well in their course and not benefiting from tutoring support.	edit



Third, the data revealed a threshold effect: approximately nine hours of tutoring per subject per semester was associated with passing grades, but only when combined with academic capacity scores of 3 or higher. Below this capacity threshold, additional tutoring produced diminishing returns.

Statistical validation confirmed a significant interaction effect between tutoring hours and academic capacity ($\beta = 0.31$, $p < .001$), even after controlling for demographic variables and prior academic performance.

Scaffold-readiness

This finding provides empirical evidence for what we term “scaffold-readiness” – the proposition that tutoring effectiveness is conditional upon students having developed sufficient academic capacity to benefit from the additional support. Tutoring provides scaffolding for learning, but scaffolding only works when students have the foundational capabilities to make use of it.

This insight has profound implications for resource allocation and intervention design. It suggests that simply increasing tutoring hours for struggling students – a common institutional response – may be ineffective if those students have not developed the underlying capacities that enable them to benefit from tutoring. Effective intervention requires simultaneous development of academic capacities alongside content support.

The finding also validates our theoretical model. If academic self-efficacy emerges from the development of learner capabilities, and if those capabilities enable students to benefit from support, then building the learner identity is not merely complementary to academic support – it is foundational to it.

Findings: The six key factors

Analysis of the relationship between the 19 factors and academic performance identified six factors with the strongest predictive power:

1. Self-regulated learning – planning phase ($r = 0.65, p < .001$)
2. Self-motivation and goal-setting ($r = 0.62, p < .001$)
3. Help-seeking behaviour ($r = 0.58, p < .001$)
4. Persistence and resilience ($r = 0.55, p < .001$)
5. Subject engagement ($r = 0.52, p < .001$)
6. Financial stability ($r = 0.48, p < .001$)

Multivariate analysis comparing students who passed all enrolled subjects with those who failed at least one subject revealed significant differences across the 19 factors, with the largest effect sizes for these six factors. Self-regulated learning in the planning phase showed the greatest discrimination between successful and unsuccessful students.

These findings confirmed and extended the insights from Project One. The factors most strongly associated with academic success spanned cognitive, behavioural, and material domains, reinforcing the multidimensional nature of what students must navigate. Notably, three of these factors – self-regulated learning, help-seeking behaviour, and persistence – align directly with Bandura’s (1997) conceptualisation of self-efficacy as involving personal agency, strategy deployment, and perseverance in the face of challenges.

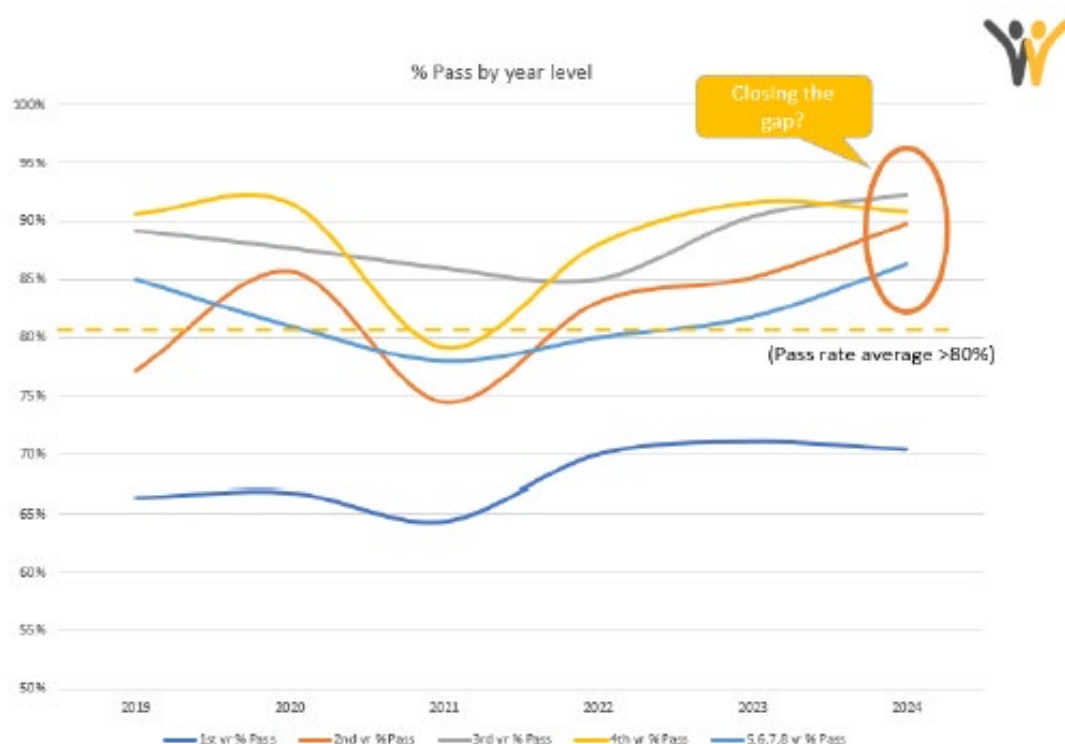
Sustained impact

Longitudinal data (Figure 11) extending beyond the formal project period provides evidence of sustained impact. Subject pass rates continued their upward trajectory, reaching 81% in 2024. By July 2025, the pass rate reached 82.4%.

Figure 11: Pass/Fail rates over time

Analysis of campus-specific outcomes revealed convergence between the two campuses by 2024 (81% and 78% respectively), compared to a 7% gap in 2019. This narrowing suggests that implementation quality and effectiveness normalised across institutional contexts over time.

Year-level analysis (Figure 12) showed particularly strong improvements in upper-year subjects. By 2024, pass rates for Indigenous students in second-, third-, and fourth-year subjects approached 90% – near parity with non-Indigenous students and a record achievement for the institution. This pattern suggests a compounding benefit of the intervention: as students progress through their programs and develop increasing academic capacity, the effectiveness of support mechanisms amplifies. First-year pass rates stabilised at approximately 70%, reflecting the transitional challenges inherent in entering higher education, but students who successfully navigated this transition with appropriate support showed dramatically improved trajectories in subsequent years.

Figure 12: Longitudinal subject pass/fail rate (2010–2024)

This temporal pattern aligns with our theoretical framework. The significantly higher pass rates in upper years suggest that initial capacity development enables academic success, which builds self-efficacy, which further enhances capacity for subsequent challenges – a virtuous cycle that produces increasingly strong outcomes over time.

The results of Project Two demonstrate that systematically building the learner identity and the capabilities that underpin it can produce substantial, sustained improvements in academic outcomes. Subject pass rates increased from 64% to over 82%, course completions doubled, attrition decreased, and performance gaps narrowed – gains that continued beyond the formal project period. Critically, these outcomes were achieved within existing curriculum and teaching structures, and the scaffold-readiness finding confirmed that capability development is foundational to the effectiveness of academic support. The implications of these findings for theory, practice, and policy are explored in the discussion that follows.

A new foundation for the future of Indigenous education

The findings from this decade-long research program offer several insights that extend beyond the immediate context of Indigenous higher education in Australia. At the most fundamental level, the research challenges prevailing assumptions about what students need in order to succeed in higher education and, by extension, what institutions should provide.

Reconceptualising student success

The dominant paradigm in higher education support has long focused on addressing presumed deficits: knowledge gaps to be filled through tutoring, cultural mismatches to be bridged through curriculum adaptation, and financial barriers to be overcome through scholarships and income support. These

interventions address real needs, but our findings suggest they rest on an incomplete understanding of what enables academic success.

The key revelation from Project One—that the capabilities required for formal learning are acquired rather than innate—reframes the challenge entirely. Students do not struggle because they lack intelligence or motivation, nor primarily because curriculum content fails to reflect their cultural backgrounds. They struggle because they have not had adequate opportunity to develop the specific dispositions, strategies, and self-regulatory skills that formal learning environments demand. These environments are not natural; they are artificial constructs with historically-specific requirements that must be learned.

This insight has profound implications for how we understand equity in higher education. If some students arrive having developed these capabilities through prior educational experiences or family practices, whilst others arrive without them, then the playing field is uneven before students even begin their studies. Institutions that assume these capabilities, rather than explicitly developing them, inadvertently privilege students from backgrounds where such development has already occurred.

The finding that Indigenous and non-Indigenous students face fundamentally similar challenges in navigating formal learning environments further complicates deficit narratives. The barriers our Indigenous students encountered were not primarily attributable to cultural difference or presumed learning style variations. They were attributable to preparation, resources, and the capacity to navigate institutional demands—challenges that affect students across populations, though often with differential intensity based on prior opportunity.

The learner identity as foundation

Our intervention model centred on building the learner identity: helping students see and understand themselves as learners, developing their metacognitive awareness, and fostering the self-regulatory skills that enable productive engagement with academic demands. This approach proved remarkably effective, producing sustained improvements in pass rates, completions, and retention that continued beyond the formal project period.

The concept of scaffold-readiness that emerged from our three-dimensional analysis provides empirical grounding for this emphasis. Tutoring (the most common form of academic support) proved effective only for students who had developed sufficient underlying capacity to benefit from it. For students with lower capacity scores, additional tutoring hours produced minimal improvement. The scaffolding could not support learning when the foundational capabilities were absent.

This finding has significant implications for resource allocation. Institutions commonly respond to struggling students by providing more tutoring, yet our data suggest this response may be ineffective, even wasteful, if students lack the capacity to make use of the support offered. Effective intervention requires simultaneous attention to capability development alongside content support. Building the learner identity is not an optional enhancement to academic support; it is foundational to its effectiveness.

The virtuous cycle

The temporal pattern observed in our longitudinal data (with substantially higher pass rates in upper years compared to first year) suggests that our intervention created conditions for a virtuous cycle. Initial capability development enabled academic success, which built self-efficacy, which enhanced capacity for subsequent challenges, which produced further success. Students who successfully navigated first year

studies with appropriate support showed dramatically improved trajectories thereafter, approaching parity with non-Indigenous students by their second, third, and fourth years.

This pattern aligns with Bandura's (1997) theorisation of self-efficacy as developed through mastery experiences but extends it by identifying the specific capabilities that enable those mastery experiences to occur. Academic self-efficacy, in our model, is not simply a belief to be instilled but an emergent property arising from genuine capability development. Students developed confidence in their academic abilities because they had, in fact, developed those abilities.

The sustained improvement beyond the formal project period provides evidence that the intervention created genuine institutional capacity rather than temporary, project-dependent gains. The capabilities developed in students, and the systems established for developing them, continued to produce benefits even as specific project resources concluded.

Beyond the compensatory paradigm

The approach advanced here represents a departure from what might be termed the compensatory paradigm that has shaped much Indigenous higher education policy and practice over recent decades. That paradigm, however well-intentioned, is founded on assumptions of deficit and loss. Indigenous students are positioned as lacking something—cultural connection, academic preparation, institutional familiarity—that the system must compensate for through adapted curricula, modified assessments, or culturally embedded content. The underlying logic is one of institutional accommodation; the implicit promise is that the system will be made easier to navigate. Yet this framing, often rooted in historical guilt, risks perpetuating dependency by positioning students as recipients of institutional benevolence rather than agents of their own development.

The capability-building approach we have tested operates from a fundamentally different premise. It recognises that formal learning environments are artificial constructs with historically-specific demands, and that the capabilities required to navigate them must be acquired by all students, regardless of background. Rather than adapting the system to accommodate presumed deficits, this approach equips students with the dispositions, strategies, and self-regulatory skills they need to succeed within existing structures—and indeed, within any formal learning environment they may encounter. The goal is not compensation but capability; not accommodation but agency. Students who develop these capacities are not dependent on adapted systems; they are equipped to drive their own futures, navigate institutions on their own terms, and carry these capabilities forward into professional and community life. This is, ultimately, an agenda for independence and self-reliance, a reorientation from what has been lost to what can be built.

Theoretical implications

This research contributes also to self-efficacy theory by demonstrating that academic self-efficacy can be systematically developed through targeted intervention, and by identifying specific psychosocial and socio-emotional factors that enable its development. Rather than treating self-efficacy as an individual psychological trait, our findings position it as an emergent property arising from a constellation of learnable capabilities.

The concept of scaffold-readiness extends understanding of how support mechanisms interact with student characteristics. It suggests that the effectiveness of educational interventions cannot be assessed independently of the capacities students bring to them—a finding with implications for evaluation research and intervention design across educational contexts.

Our operationalisation of the Cultural Interface framework demonstrates its utility as an analytical tool for understanding student experience without recourse to deficit or romanticised framings. By directing attention to what students navigate and how, rather than what they lack, the framework enabled insights that more conventional approaches might have obscured.

Implications for practice

For institutions seeking to improve Indigenous student outcomes—or indeed, outcomes for any students who arrive under-prepared for the demands of formal learning—our findings suggest several practical directions.

First, institutions should recognise that capability development is a legitimate and necessary function of higher education, not merely an ancillary support service. The capabilities required for formal learning are not prerequisites that students should possess upon entry; they are outcomes that institutions have responsibility to develop. This recognition has implications for how support services are positioned, resourced, and integrated with academic programs.

Second, support should be structured around regular, systematic engagement rather than reactive crisis response. Our four-touch-point model—with structured conversations addressing transition, academic, pastoral, and support domains at weeks 3, 6, 9, and the final week of each semester—enabled early identification of challenges, ongoing capability development, and sustained relationship-building. Students experiencing imposter syndrome and reluctance to seek help were reached through this proactive approach in ways that reactive services would not have achieved.

Third, tutoring and other academic support should be coupled with explicit attention to developing the self-regulatory and metacognitive capacities that enable students to benefit from such support. Simply increasing tutoring hours for struggling students is unlikely to be effective; building the learner identity is the necessary foundation.

Fourth, technology-enabled monitoring systems, such as the WillowSoft platform employed in our intervention, can facilitate rapid response to emerging challenges and create data for continuous improvement. The capacity to track student experience in real time enabled differentiated support and strategic resource allocation that would not have been possible with traditional approaches.

Fifth, attention to financial stability and material conditions remains essential. Financial stress emerged as one of the six factors most strongly associated with academic outcomes. Institutions cannot address capability development in isolation from the material circumstances that constrain students' capacity to engage with their studies.

Implications for policy

At the policy level, our findings suggest that current approaches to Indigenous higher education may be insufficiently attentive to the mechanisms through which student success actually occurs. Equity policy has emphasised access—pathway programs, alternative admission criteria, financial support—on the assumption that once students enter higher education, success will follow. Our data suggest this assumption is unfounded. Access without capability development produces the revolving door that cohort analyses continue to document.

As the Australian Government undertakes consultation on a new national Indigenous education policy (Australian Department of Education, 2025), there is now an opportunity to move beyond access-focused

frameworks toward approaches that explicitly address how students succeed, not merely whether they enrol. The evidence presented here offers a foundation for such a shift.

Policy frameworks should recognise capability-building as a distinct and necessary intervention, not merely an aspect of generic student support. This may require dedicated funding streams, professional development for support staff, and accountability mechanisms that track capability development alongside traditional metrics of access and completion.

The finding that Indigenous and non-Indigenous students face similar fundamental challenges suggests that effective interventions need not be premised on cultural specificity. Building universal learning capabilities, whilst acknowledging the specific contextual factors shaping Indigenous students' experiences, offers a path forward that is both effective and scalable. Institutions need not develop separate support systems only for Indigenous students; rather, they should ensure that mainstream systems also explicitly address capability development in ways that benefit all under-prepared students.

Finally, policy should attend to the institutional conditions that enable effective intervention. Our implementation occurred following a formal restructuring of the Indigenous centre and as part of a refreshed institutional strategy. Sustainable improvement requires institutional commitment, appropriate resourcing to transition to more progressive services, and integration with broader academic structures – conditions that policy can encourage but that institutions must ultimately provide.

Limitations and future research

Several limitations should be acknowledged when interpreting these findings.

First, the intervention was implemented at a single regional Australian university, and whilst it involved two campuses and over 750 students across approximately 105 courses, questions remain about generalisability to other institutional contexts. Metropolitan universities, Group of Eight institutions, and universities serving different student demographics may present different challenges and opportunities. Replication across diverse institutional settings would strengthen confidence in the broader applicability of our model.

Second, the absence of a randomised control group limits causal inference. Our longitudinal comparative design, benchmarking outcomes against historical data from the same institution, provides reasonable evidence of intervention effects, but cannot definitively rule out alternative explanations such as cohort differences, broader sectoral trends, or other concurrent institutional changes. The decision to provide support to all students rather than withholding it from a control group was ethically appropriate, though it limits the strength of causal inference.

Third, whilst our intervention addressed multiple factors simultaneously, the design does not enable precise determination of which components were most essential. The structured engagement model, the technology-enabled monitoring, the strategic tutor allocation, and the explicit focus on building the learner identity were implemented as an integrated package. Future research might employ component analysis to identify which elements are necessary and which are merely facilitative.

Fourth, our focus on undergraduate students means that findings may not generalise to postgraduate contexts, where students face different challenges and typically arrive with more developed academic capabilities. Similarly, our emphasis on coursework programs means that findings may not apply to research higher degree contexts.

Fifth, whilst we tracked outcomes for several years beyond the formal project period, longer-term follow-up would strengthen understanding of sustained impact. Questions remain about whether the capabilities developed during the intervention persist throughout students' careers, and whether they transfer to professional contexts after graduation.

Future research should examine several questions that our study raises but does not definitively answer. What is the optimal timing and intensity of capability-building intervention? Our four-touch-point model was effective, but other configurations might prove more efficient or more effective. How do the specific capabilities we identified interact with disciplinary context? Our findings were aggregated across diverse fields of study, but capability requirements may vary across disciplines. How can the learner identity approach be integrated with curriculum design, rather than operating parallel to it? And how might technology-enabled approaches be further developed to scale capability-building intervention whilst maintaining the relational elements that appeared crucial to its effectiveness?

Concluding remarks

The gap in higher education outcomes between Indigenous and non-Indigenous Australians has proven resistant to decades of policy attention and equity investment. This paper has argued that the persistence of this gap reflects, at least in part, a fundamental misunderstanding of what enables student success.

Students do not succeed in higher education simply because they are admitted, nor simply because curriculum content reflects their cultural backgrounds, nor simply because tutoring addresses their knowledge gaps. They succeed when they have developed the capabilities required to navigate formal learning environments—capabilities that are acquired, not innate, and that institutions have responsibility to develop.

Our decade-long research program identified the specific psychosocial and socio-emotional factors that enable academic persistence and tested whether systematically building these capabilities would improve outcomes. The results were unambiguous. Subject pass rates increased from 64% to over 82%. Course completions doubled. Attrition decreased. Performance gaps narrowed. And these improvements were sustained beyond the formal project period, suggesting genuine institutional capacity rather than temporary, project-dependent gains.

The concept of building the learner identity—helping students see and understand themselves as learners, developing their metacognitive awareness and self-regulatory skills, fostering ownership and agency over their own learning—proved central to these improvements. This is not remediation for deficits; it is capability-building that recognises the historically-specific demands of formal learning environments and takes institutional responsibility for helping students meet them.

The finding that Indigenous and non-Indigenous students face fundamentally similar challenges in navigating these environments challenges deficit narratives and points toward approaches that are both effective and respectful of student agency. Building universal learning capabilities, whilst acknowledging the specific contexts that shape Indigenous students' experiences, offers a path forward that neither pathologises cultural difference nor ignores genuine barriers to success.

Twenty years ago, Malcolm and Rochecouste (2003) observed that research on Indigenous higher education was overweighted with advice rather than analysis. This paper has sought to provide analysis: longitudinal data on what enables Indigenous students to persist and succeed, empirical testing of an

intervention model, and evidence of sustained impact. The advice that follows from this analysis is straightforward: build the learner, and academic success will follow.

References

- Anyichie, A. C., Yee, N., Perry, N., & Hutchinson, L.R. (2016). *Supporting culturally diverse students with self-regulated learning*. Paper presented at the annual meeting of Canadian Society for the Study of Education (CSSE) 2016, Calgary, AB.
- Anyichie, Aloysius & Butler, Deborah. (2018). *A culturally responsive teaching and self-regulated learning framework*. In P. Chen (Session Organizer), *Examining synergistic relationships among self-regulated learning and motivational variables*. Presented during the annual meeting of the American Educational Research Association, San Antonio, Texas.
- Arbon, V., & Nugent, M. (1994). *More than an accessory: A critical approach to Aboriginal access programs*. Paper presented at the International Access Network Symposium, University of Southern Maine, Portland, ME, United States.
- Australian Department of Education. (2025). *Submissions for the First Nations Education Policy consultation are now open!* See <https://www.education.gov.au/first-nations-education-policy/announcements/submissions-first-nations-education-policy-consultation-are-now-open>
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.
- Bandura, A. (2012). *On the functional properties of perceived self-efficacy*. *CBE – Life Sciences Education*, 11(3), 289-292.
- Barnes, A. L. (2000). Learning preferences of some Aboriginal and Torres Strait Islander students in the veterinary program. *The Australian Journal of Indigenous Education*, 28(1), 8-16.
- Barney, K. (2018). 'We need more mob doing research': Developing university strategies to facilitate successful pathways for Indigenous students into higher degrees by research. *Higher Education Research & Development*, 37(5), 908-922. <https://doi.org/10.1080/07294360.2018.1467382>
- Basch, C. E. (2011). Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Journal of School Health*, 81(10), 593-598.
- Bean, J. P., & Eaton, S. B. (2000). A psychological model of college student retention. In J. M. Braxton (Ed.), *Reworking the student departure puzzle: New theory and research on college student retention* (pp. 48-61). Vanderbilt University Press.
- Behrendt, L., Larkin, S., Griew, R., & Kelly, P. (2012). *Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people: Final report*. Department of Industry, Innovation, Science, Research and Tertiary Education.
- Bettinger, E. P., & Long, B. T. (2009). Addressing the needs of underprepared students in higher education: Does college remediation work? *Journal of Human Resources*, 44(3), 736-771.
- Bennett, R., Strehlow, K., & Hill, B. (2022). Myth-busting in an Aboriginal pre-university bridging program: Embedding transformative learning pedagogy. *The Australian Journal of Indigenous Education*, 51(1). <https://doi.org/10.55146/ajie.2022.24>.
- Bhutoria, A. (2022). Personalized education and artificial intelligence in the United States, China, and India: A systematic review using a human-in-the-loop model. *Computers and Education: Artificial Intelligence*, 3, 100068. <https://doi.org/10.1016/j.caeai.2022.100068>
- Boulton-Lewis, G. M., Wilss, L., & Lewis, D. C. (2001). Changes in conceptions of learning for Indigenous Australian university students. *British Journal of Educational Psychology*, 71(2), 327-341. <https://doi.org/10.1348/000709901158550>

- Boulton-Lewis, G. M., Lewis, D., & Wilss, L. A. (2003). Dissonance between conceptions of learning and ways of learning for Indigenous Australian university students. *Studies in Higher Education*, 28(1), 79–89. <https://doi.org/10.1080/03075070309300>
- Bourke, C. J., Burden, J. K., & Moore, S. (1996). *Factors affecting performance of Aboriginal and Torres Strait Islander students at Australian universities: A case study*. Canberra, Australia: Australian Government Publishing Service.
- Burden, J., Bourke, E. A., Bourke, C., & Rigby, K. (1998). *Access, participation, transformation: A study of factors contributing to Indigenous student attrition and retention at University of Technology Sydney*. Underdale, SA: University of South Australia, Aboriginal Research Institute.
- Burns, E. C., Lowe, K., Leonard, A., & Tsiamis, J. (2023). Australian Aboriginal and Torres Strait Islander students' motivation to continue in senior science: An expectancy value theory and intersectional identity approach. *Contemporary Educational Psychology*, 72, <https://doi.org/10.1016/j.cedpsych.2022.102125>.
- Chee, C. L., Shorty, G., Kurpisu, R., & Sharon, E. (2019). Academic stress of Native American undergraduates: The role of ethnic identity, cultural congruity, and self-beliefs. *Journal of Diversity in Higher Education*, 12(1), 65–73.
- Claxton, G., & Carr, M. (2004). A framework for teaching learning: The dynamics of disposition. *Early Years*, 24(1), 87–97.
- Costa, A. L., & Kallick, B. (2000). *Discovering and exploring habits of mind*. Association for Supervision and Curriculum Development.
- Craven, R. G., & Marsh, H. W. (2005). Dreaming futures: An empirical analysis of Indigenous Australian students' aspirations, self-concepts, and realities. In H. W. Marsh, R. G. Craven, & D. M. McInerney (Eds.), *New frontiers for self research* (pp. 211–232). Information Age.
- Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425–453.
- Department of Education. (2023). *HEIMS Data: Section 17 - Completion Rates*. Retrieved 30 March 2025 from <https://www.education.gov.au/higher-education-statistics/resources/2023-section-17-completion-rates>.
- Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.
- Harrison, N. (2004). Rethinking critical thinking: Indigenous students studying at university. *Teaching Education*, 15(4), 375–384.
- Harrison, N., & Greenfield, M. (2011). Relationship to place: Positioning Aboriginal knowledge and perspectives in classroom pedagogies. *Critical Studies in Education*, 52(1), 65–76. <https://doi.org/10.1080/17508487.2011.536513>
- Hill, B., Nilson, C., Uink, B., & Fetherston, C. (2023). Transformation at the cultural interface: Exploring the experiences of Aboriginal and Torres Strait Islander university students. *The Australian Journal of Indigenous Education*, 52(2). <https://doi.org/10.55146/ajie.v52i2.656>.
- Hill, B., Winmar, G., & Woods, J. (2020). Exploring transformative learning at the cultural interface: Insights from successful Aboriginal university students. *The Australian Journal of Indigenous Education*, 49(1), 2–13. <https://doi.org/10.1017/jie.2018.11>
- Hodges, B., Bedford, T., Hartley, J., Klinger, C., Murray, N., O'Rourke, J., & Schofield, N. (2017). *Enabling retention: Processes and strategies for improving student retention in university-based enabling programs*. Office for Learning and Teaching.
- Honick, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review*, 17, 63–84. <https://doi.org/10.1016/j.edurev.2015.11.002>

- Hoppa, M. (2012). *Correlational study of the variables of self-esteem, Self-efficacy, and academic success in a population of Native American students*. PhD thesis, Capella University.
- Karabenick, S. A., & Dembo, M. H. (2011). Understanding and facilitating self-regulated help seeking. *New Directions for Teaching and Learning*, 2011(126), 33-43.
- Klassen, R. M. (2004). Optimism and realism: A review of self-efficacy from a cross-cultural perspective. *International Journal of Psychology*, 39(3), 205-230. <https://doi.org/10.1080/00207590344000330>
- Konu, A., & Lintonen, T. (2006). Theory-based survey analysis of well-being in secondary schools in Finland. *Health Promotion International*, 21(1), 27-36. <https://doi.org/10.1093/heapro/dai028>
- Kristoff, T., & Cottrell, M. (2021). Supporting First Nations and Métis post-secondary students' academic persistence: Insights from a Canadian First Nations-affiliated Institution. *Canadian Journal of Higher Education*, 51(2), 46-60. <https://doi.org/10.47678/cjhe.vi0.188993>
- Kucirkova, N., & Leaton Gray, S. (2023). Beyond personalization: Embracing democratic learning within artificially intelligent systems. *Educational Theory*, 73(4), 469-489. <https://doi.org/10.1111/edth.12590>
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education*, 79(5), 540-563.
- MacFarlane, K. (2018). Higher education learner identity for successful student transitions. *Higher Education Research & Development*, 37(6), 1201-1215.
- Malcolm, I. G., & Rochecouste, J. (2003). Aboriginal and Torres Strait Islander literacy in higher education: A survey of the literature. *Literacy and Numeracy Studies*, 12(2), 15-30.
- Martin, A. J. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology*, 77(2), 413-440. <https://doi.org/10.1348/000709906X118036>
- Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, 43(3), 267-280.
- Martin, A. J., & Marsh, H. W. (2009). Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs. *Oxford Review of Education*, 35(3), 353-370.
- Miles, C., Grummon, P., & Maduschke, K. M. (1996). *Working: Assessing skills, habits, and style*. Clearwater, FL: H & H Publishing Company, Inc.
- Nakata, M. (2007a). *Savaging the disciplines: Disciplining the savages*. Aboriginal Studies Press.
- Nakata, M. (2007b). The Cultural Interface. *The Australian Journal of Indigenous Education*, 36(S1), 7-14.
- Nakata, M., Nakata, V. & Chin, M. (2008). Approaches to the academic preparation and support of Australian Indigenous students for tertiary studies. *The Australian Journal of Indigenous Education*, 37(S1), 137-145
- Page, S., & Asmar, C. (2008). Beneath the teaching iceberg: Exposing the hidden support dimensions of Indigenous academic work. *The Australian Journal of Indigenous Education*, 37(S1), 109-117. <https://doi.org/10.1375/S1326011100000442>
- Page, S., Farrington, S., & Daniel-DiGregorio, K. (2007). The student experiences study: Using research to transform curriculum for Indigenous health sciences students. In A. Brew & J. Sachs (Eds.), *Transforming a university: The scholarship of teaching and learning in practice* (pp. 105-115). Sydney University Press.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, 37(2), 91-105.

- Pham, T., Blue, L., Baeza, A., Anderson, P., Xing, C., & Saward, M. (2024). Higher education success factor model: A means to explore factors influencing Indigenous Australian completion rates. *Student Success*. <https://doi.org/10.5204/ssj.3154>
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33–40.
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138(3), 353–387. <https://doi.org/10.1037/a0026838>
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261–288. <https://doi.org/10.1037/0033-2909.130.2.261>
- Roedel, T. D., Schraw, G., & Plake, B. S. (1994). Validation of a measure of learning and performance goal orientations. *Educational and Psychological Measurement*, 54(4), 1013–1021.
- Schunk, D. H., & Greene, J. A. (2017). Historical, contemporary, and future perspectives on self-regulated learning and performance. In *Handbook of self-regulation of learning and performance* (pp. 1–15). Routledge.
- Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 15–31). Academic Press. <https://doi.org/10.1016/B978-012750053-9/50003-6>
- Sonn, C. C., & Fisher, A. T. (1996). Psychological sense of community in a politically constructed group. *Journal of Community Psychology*, 24(4), 417–430. [https://doi.org/10.1002/\(SICI\)1520-6629\(199610\)24:4](https://doi.org/10.1002/(SICI)1520-6629(199610)24:4)
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271–324.
- Trujillo, G. & Tanner, K. D. (2017). Considering the role of affect in learning: Monitoring students' self-efficacy, sense of belonging, and science identity. *CBE – Life Sciences Education*, 13(1), 6–15.
- Siegesmund, A. (2017). Using self-assessment to develop metacognition and self-regulated learners. *FEMS Microbiology Letters*, 364(11), fnx096.
- Tanner, K. D. (2012). Promoting student metacognition. *CBE – Life Sciences Education*, 11(2), 113–120.
- Tierney, W. G., & Sablan, J. R. (2014). Examining college readiness. *American Behavioural Scientist*, 58(8), 943–946.
- Tinto, V. (1997). Classrooms as communities: Exploring the education character of student persistence, *Journal of Higher Education*, (68), 599–623.
- Topping, K. J. (1996). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher Education*, 32(3), 321–345.
- Trudgett, M., Page, S., & Harrison, N. (2016). Brilliant minds: A snapshot of successful Indigenous Australian doctoral students. *The Australian Journal of Indigenous Education*, 45(1), 70–79. <https://doi.org/10.1017/jie.2016.8>
- Universities Australia. (2023). *Universities Australia Indigenous Strategy Annual Report*. Universities Australia. https://universitiesaustralia.edu.au/wp-content/uploads/2023/06/UA-2023-Indigenous-Strategy-Report.pdf?utm_source=chatgpt.com
- Usher, K., Lindsay, D., Miller, M., & Miller, A. (2005). Challenges faced by Indigenous nursing students and strategies that aided their progress in the course: A descriptive study. *Contemporary Nurse*, 19(1–2), 17–31. <https://doi.org/10.5172/conu.19.1-2.17>
- Usher, E. L., & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research*, 78(4), 751–796. <https://doi.org/10.3102/0034654308321456>

- Vancouver, J. B., & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Psychology*, 91(5), 1146–1153.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331(6023), 1447–1451.
- Weinstein, C. E., Palmer, D. R., & Acee, T. W. (2002). *Learning and Study Strategies Inventory (LASSI): User's manual* (2nd ed.). H & H Publishing.
- White, C. (1996). Verbal reasoning abilities of Aboriginal and Torres Strait Islander tertiary applicants. *The Australian Journal of Indigenous Education*, 24(2), 27–32.
<https://doi.org/10.1017/S132601110000244>
- WillowSoft Pty Ltd. (n.d.). *WillowSoft: Adaptable and flexible student success software for Indigenous students*. <https://www.willowsoft.com.au/>
- Winne, P. H. (2018). Theorising and researching levels of processing in self-regulated learning. *British Journal of Educational Psychology*, 88(1), 9–20.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166–183.
- Zimmerman, B. J., & Schunk, D. H. (Eds.). (2011). *Handbook of self-regulation of learning and performance*. Routledge.

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