

A Strength-Based Approach: Empowering Aboriginal and Torres Strait Islander Students to Reach their Learning Potential

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Solid Pathways – STEM is a statewide initiative that has the capacity to deliver online lessons to over 900 students each school term. It provides students in Years 4 to 6 the opportunity to engage in a rigorous STEM-focused academic curriculum through an online platform, as well as attend university experience days. The program draws on the Australian Curriculum’s General Capabilities of critical and creative thinking, and embedding the cross-curriculum priority of Aboriginal and Torres Strait Islander Histories and Cultures. Students have the opportunity to build upon both their existing sense of cultural identity as Aboriginal and Torres Strait Islander young people and their self-efficacy as high achieving students. The program aims to raise students’ expectations of themselves as learners and enhance post- school aspirations to include tertiary pathways. In this paper the authors provide an insight into the initiative.

‘The gains made in Queensland against the indicators for Indigenous children and young people ... are being achieved through key investments [including] ... Solid Pathways, a partnership with the University of Queensland to support high achieving Aboriginal and Torres Strait Islander students to continue their academic success and enter tertiary pathways.’ (Queensland Government, 2017, pp. 10-11)

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Since its foundation, Solid Pathways – STEM has capitalised on the promise of technology. During its earlier offerings, students participated in Solid Pathways using the Learning Place's iConnect Blackboard platform. In 2019, a coordinated intentional collaboration approach was adopted, involving the Queensland Virtual STEM Academy (QVSA), regional Indigenous teams and STEM champions across the state. This collaboration has allowed students to engage in authentic, real-world learning experiences that utilise traditional scientific processes, perspectives and knowledge as the basis for engaging students in STEM education.

With the ongoing ever-changing opportunities offered through technology and the increasing demand for online learning nationally and globally, Solid Pathways – STEM now uses the innovative virtual online learning platform, iSee. The iSee platform enables like-minded Aboriginal and Torres Strait Islander students from all over Queensland to collaborate and equip themselves with the skills they need to engage and navigate their online learning experiences

in real time. The iSee platform also demonstrated itself as an effective way of ensuring continuity of learning during COVID-19; in Term 2 over 350 students participated in an innovative adaption known as Solid Pathways – STEM@home.

For Aboriginal and Torres Strait Islander Peoples science has been integral to their way of living for thousands of years. These traditions have developed knowledge about the world through observation and utilisation of all the senses; through prediction and hypothesis; through testing and through making generalisations within specific contexts. These scientific methods have been practiced and transmitted from one generation to the next and contribute to particular ways of knowing the world that are unique and complementary to western scientific knowledge. The transfer of these knowledges relies on cultural practices including Aboriginal and Torres Strait Islander languages, stories, rituals, dances and songs.

A deep respect for Aboriginal and Torres Strait Islander practices and knowledge underpins the philosophy and practice of the Solid Pathways – STEM program. The ingenuity and creativity of Aboriginal and Torres Strait Islander knowledge systems has been reaffirmed by the recognition of traditional contexts for technologies and concepts and application in the past, present and future. Such contexts have also supported modern STEM career pathways for Aboriginal and Torres Strait Islander students.

With this impetus, the Solid Pathways – STEM program aims to deliver quality online learning that develops students' STEM capabilities and nurtures their curiosity through critical and creative thinking. The key goal for the program is to increase the participation and achievement of Aboriginal and Torres Strait Islander students in STEM, and thus reflect

the key priorities identified in the Advancing Aboriginal and Torres Strait Islander Education Action Plan.

Culturally Responsive Pedagogies

The pedagogical approach adopted by the program is predicated on a set of beliefs that engage students in STEM learning and develop their critical and creative thinking skills in culturally and individually inclusive ways while nurturing students' identity and voice. As such, the pedagogical approach of the program and specific learning activities taking place online include Aboriginal and Torres Strait Islander perspectives and inquiry skills pedagogies. This is demonstrated through the utilisation of three aligned pedagogical frameworks.

The program uses Uncle Ernie's Holistic Framework and the '8 Aboriginal Ways of Learning' to inform teachers' pedagogy and illustrate how working, learning and doing are integrated and holistic. The Holistic Framework was developed by Ernie Grant, Djirrabal Elder, and published by the Innisfail and District Education Centre. It incorporates the elements of *land, language* and *culture* in the context of particular *times, places* and *relationships* and puts emphasis on 'relationships' and the wider context of family and community. The Framework offers an approach by which we could support students to connect to their ancestral relatedness and defines who they are and where they belong, enabling students to see themselves in their local context and feel liberated to express their own voices. It promotes cross-cultural understanding and helps students become two-way strong, where they move confidently across cultures, without comprising their Aboriginal and Torres Strait Islander identities.

The '8 Aboriginal Ways of Learning' Framework was developed by Yunkaporta (2009) and comes from country in Western New South Wales. The knowledges in this Framework originate from Baakindji, Ngiyampaa, Yuwaalaraay, Gamilaraay, Wiradjuri, Wangkumarra and other nations. It consists of eight interconnected pedagogical practices, which enables the online teachers to include Aboriginal and Torres Strait Islander ways of knowing and doing into everyday practice. Each of the eight ways: story sharing; community links; deconstructing/reconstructing; non-linear; land links; symbols and images; non-verbal; and learning maps are rarely used in isolation. The 8 Ways Framework supports teachers to include Aboriginal and Torres Strait Islander ways of knowing and doing into every lesson and enables students to learn in culturally relevant ways that reflect their ways of learning and being.

The third pedagogical framework used is the inquiry-based approach. In Solid Pathways – STEM this approach allows students to explore how Aboriginal and Torres Strait Islander people have utilised critical and creative thinking skills as a means of survival for over 50

thousand years. The framework also enables this knowledge to be utilised with Western science to create solutions for 21st century problems.

Embedding of Aboriginal and Torres Strait Islander Perspectives and Knowledge

A powerful way of incorporating Aboriginal and Torres Strait Islander perspectives is to weave them in meaningful and authentic ways that align with the knowledge, skills and understanding identified in the curriculum (Davis & Sheehan, 2009). The teachers use a combination of evidence-based practices to improve student engagement during the online lessons. This includes: the use of Indigenous culture, languages and knowledge in the learning context; using resources developed for and by Indigenous people; and visibility of Indigenous people as role models.

The program embeds Aboriginal and Torres Strait Islander histories and cultures through a culturally responsive curriculum and pedagogical model. Students are engaged in ways that support them to embrace and affirm cultural identity and work towards increasing achievement, and instil self-belief in their academic ability.

The truism that ‘belief in one’s ability to succeed is a precursor to success’ is especially important for Aboriginal and Torres Strait Islander students. In helping students achieve their academic goals and educational aspirations, the program contributes to the development of a pool of positive role models and leaders from Aboriginal and Torres Strait Islander communities, to inspire students and demonstrate the successes that can be achieved through education. The profiling of positive Aboriginal and Torres Strait Islander role models is one of the most positive aspects of the program.

Prevailing societal attitudes and beliefs have not often promoted the notion of success amongst Aboriginal and Torres Strait Islander peoples. Thus, the program’s success in this sphere is notable.

Solid Pathways – STEM offers a culturally responsive teaching and learning model, by responding with agency to the cultural norms of the settings students represent. The online teachers use the cultural knowledge, prior experience and frames of reference of students as a lens for considering their teaching and to design learning experiences that are more relevant, engaging and effective. Building on students’ cultural capital enhances a strong sense of self-identity and pride for Aboriginal and Torres Strait Islander students. It is the foundation for an engaging learning environment where students develop into curious and enthusiastic lifelong learners who value their social and cultural context.

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