

SUBMISSION

Submission to the Government of Western Australia's Department of Education

# Submission on the Pathways to Post-School Success Review discussion paper

8 December 2023

**The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.**

A National brain drain, skills shortages and rapid digitalisation mean that Australia needs its future workforce to be more resilient and responsive to ensure enough workers are in roles where they are needed the most. The Western Australian (WA) Pathways to Post-School Success (PPSS) discussion paper is timely in addressing the need for equitable access to senior secondary pathways and building a skilled workforce. ATSE welcomes the analysis of WA's senior secondary pathways and supports preparing WA students with the skills and knowledge required to enter the workforce and face the challenges of post-school life.

ATSE makes the following recommendations for the PPSS discussion paper:

**Recommendation 1:** Provide equal access to resources, opportunities, infrastructure and teaching quality to support all WA senior secondary students.

**Recommendation 2:** Develop strategies that resource schools to equip STEM teachers with essential skills to attract, motivate and retain STEM-skilled teachers, for example, through the STELR program.

**Recommendation 3:** Embed equity and diversity into the core framework of the Pathways to Post-School Success reforms.

**Recommendation 4:** Align WA educational outcomes to the National Skills Taxonomy being developed by Jobs and Skills Australia.

**Recommendation 5:** Consider senior secondary students' positive wellbeing as a stand-alone objective in the Pathways to Post-School Success reform.

**Recommendation 6:** Encourage role modelling and storytelling to improve students' exposure to different career pathways and improve career confidence.

## Translating national skills shortages into better outcomes for students post-school

The Australian 2023 Skills Priority List shows Australia faces shortages in 36% of occupations (JSA 2023). The Australian Government's 2023 Skills Priority List identified that 82% of health professional occupations and 69% of ICT professionals are in shortage (JSA 2023). Shortages are especially common across professions that require science, technology, engineering and mathematics (STEM) skills, and in regional and remote areas. ATSE's recent ['Our STEM skilled future'](#) report examined five key areas where the current and possible future lack of skilled workers could hold Australia back from reaching its aspirations (ATSE 2022). These areas included skills core to the critical minerals and energy sectors, mathematics in remote schools, digital skills, technology-driven agriculture, engineering and entrepreneurial skills.

The solutions to STEM skills shortages begin at school. Nationally, students in regional, rural and remote (RRR) schools score below the minimum standard for mathematics (Wienk 2020). For science, an average 15-year-old student from remote Australia is around 1.5 years behind metropolitan students (DoE 2023). To address this urgent and growing gap, Australian students in all states and territories need to have access to high-quality, engaging and relevant STEM education that catalyses their interest and capability to think critically, engage with complex challenges and inspire them to pursue careers in the sectors made possible by STEM skills.

Greater focus should be placed on empowering teachers and bringing more STEM professionals with real-world experience into classrooms, equipping teachers to draw upon real-world examples and bringing inspiring role models into the classroom. Often, principals in regional and remote communities have limited experience and teachers are usually early in their careers due to programs that place them in such communities. In addition, across Australia's education systems, teachers are increasingly being called on to teach out-of-field. The WA Government's School Curriculum and Standards Authority's annual report (Government of Western Australia 2023) showed that in 2022-2023, WA senior secondary schools achieved 54% compliance for course outlines and 26% for assessment outlines. WA students are not effectively equipped to pursue further education and careers post-school where they're needed the most.

Proven programs such as ATSE's STELR program pair engaging hands-on classroom resources with teacher curriculum materials, linking the science curriculum to sustainable engineering and energy principles. STELR supports out-of-field teachers in STEM classrooms, empowering them through a community of practice and peer support. ATSE's Shape Your Future program also brings young STEM professionals into the classroom to educate and inspire students about the broad variety of careers made possible through studying science and mathematics.

**Recommendation 1:** Provide equal access to resources, opportunities, infrastructure and teaching quality to support all WA senior secondary students.

**Recommendation 2:** Develop strategies that resource schools to equip STEM teachers with essential skills to attract, motivate and retain STEM-skilled teachers, for example, through the STELR program.

## Supporting diversity in WA's education system

ATSE's education report, '[Our STEM skilled future](#),' identified that increasing diversity and inclusion (D&I) in the workforce is critical to addressing workforce shortages and enabling creative responses to the most pressing and complex challenges (ATSE 2022). Current capability gaps cannot be filled without an increase in workforce participation.

Within the STEM sector, equal representation of women, Aboriginal and Torres Strait Islander people, those living with disabilities, culturally and linguistically diverse people, and neurodiverse individuals has been lacking. Demographics from the Office of the Chief Scientist showed that 0.5% of the Aboriginal and Torres Strait Islander population have a STEM qualification, compared to 5% of the non-Indigenous population (Leigh et al. 2020). Women comprise just 37% of university enrolments (DISR 2023) and only 27% of the STEM workforce (CoA 2023). Such imbalance and under-representation of minority groups need to be addressed.

Participation in senior secondary mathematics and advanced mathematics is usually a prerequisite for engineering programs. In a survey of Western Australian students, the main reasons students did not enrol in advanced mathematics included frustration that advanced mathematics had a higher workload and more complexity (Hine 2017). Year 9 NAPLAN scores showed that 83% of indigenous students reached the national minimum standard of numeracy, compared to ~96% for non-indigenous students (Wienk 2020). A core aim of the Pathways to Post-School Success reforms should be to increase the participation of underrepresented students in STEM careers and other critical professions.

**Recommendation 3:** Embed equity and diversity into the core framework of the Pathways to Post-School Success reforms.

## Overcoming barriers to WA students accessing equitable pathways

Currently, there is a lack of equitable access to- and knowledge of- the skills needed to pursue various careers. ATSE supports the discussion paper's suggestion to broaden students' skill sets. As per ATSE's education report, '[Our STEM skilled future](#)', a self-assessment tool and quality framework should be supplied to education providers and organisations to self-assess their STEM training (ATSE 2022). Building a centralised source of STEM resources and upskilling career counsellors in schools would go some way to providing students with the tools and guidance for post-school success.

ATSE also advocates the development of a National Skills Taxonomy, which Jobs and Skills Australia are now developing. The National Skills Taxonomy will provide a common language for stakeholders (such as students, workers, employers, and skills and training providers) to identify and articulate skills. The Pathways to Post-School Success reforms would benefit from aligning WA educational outcomes to the National Skills Taxonomy to better illuminate career paths linked to senior secondary subjects.

**Recommendation 4:** Align WA educational outcomes to the National Skills Taxonomy being developed by Jobs and Skills Australia.

### **Emphasising student wellness to support post-school success**

ATSE believes the PPSS reforms should consider senior secondary students' positive wellbeing as a stand-alone objective. A barrier to equitable access to successful career pathways is confidence and communication. Educators' perception of confidence in STEM subjects shows that males are significantly more confident; in the case of engineering, perceived male confidence was 63%, as opposed to female students at 2% (CoA 2023). Instilling a culture of lifelong learning can facilitate the workforce and help current students become upskilled.

Role modelling and storytelling can help improve the perception of career options available after graduation. This can include drawing upon WA professionals at different stages of their careers and retirement (within the STEM sector and beyond) to engage with schools. Improved teacher training is also needed to address the challenges and opportunities presented by neurodiverse students.

Conducting comprehensive data collection on student wellness can help improve understanding of where interventions should be targeted- something [ATSE's Submission to the Jobs and Skills Australia Consultation](#) emphasised (ATSE 2023). For example, greater coordination of assessment due dates between teachers can help reduce student pressure from schoolwork. Including greater weighting on students' positive wellbeing in the PPSS reforms can help promote post-school confidence and career satisfaction.

**Recommendation 5:** Consider senior secondary students' positive wellbeing as a stand-alone objective in the Pathways to Post-School Success reform.

**Recommendation 6:** Encourage role modelling and storytelling to improve students' exposure to different career pathways and improve career confidence.

*ATSE thanks the Government of Western Australia's Department of Education for the opportunity to respond to the Pathways to Post-School Success review discussion paper. For further information, please contact [academypolicyteam@atse.org.au](mailto:academypolicyteam@atse.org.au).*

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