

SCIENCE & TECHNOLOGY AUSTRALIA

POLICY SUBMISSION

14 SEPTEMBER 2023

RESPONSE TO THE PATHWAYS TO DIVERSITY IN STEM DRAFT RECOMMENDATIONS

Science & Technology Australia thanks the Panel and the Department for this opportunity to respond to the draft recommendations of the Pathways to Diversity in STEM review.

Science & Technology Australia is the peak body for the nation's science and technology sectors, representing 144 member organisations and more than 115,000 experts and entrepreneurs working in STEM. STA is a longstanding champion of diversity, equity and inclusion in STEM.

STA's Superstars of STEM program is a world-leading Australian success story that sits at the heart of our national effort to drive diversity in STEM. It plays a central role to train diverse, confident, skilled media and public role models who power the rest of Australia's STEM diversity initiatives.

At the headline level, we urge the Panel to recommend actionable policies to the Australian Government including:

- 1. Establish a new Diversity in STEM Council and model the impact of a Workforce Diversity Tax Incentive to drive systemic shifts in workplace practices and cultures so diverse talent can pursue and thrive in STEM careers.**
- 2. 'Stay the course and scale' proven successful diversity-driving initiatives such as Superstars of STEM. The final report should recommend the Government make a decade-long funding commitment to the existing successful diversity in STEM programs including Superstars. It should also double investment in Superstars of STEM to scale outreach to media and young Australians in schools to create 'mass and momentum' based on proven success.**
- 3. Enshrine 'elevate and invest in Indigenous STEM' as a standalone priority in Australia's next National Science and Research Priorities, appoint an Indigenous Chief Scientist and fund Indigenous-led STEM organisations that work in Indigenous STEM education and careers.**

We offer STA's assistance to refine the panel's interim recommendations into implementable policy actions that can be adopted by the Government.

Objective 1

Improve the coordination, oversight and evidence base for diversity in STEM initiatives through governance and leadership.

Draft Recommendation 1a

The Australian Government should set up an ongoing central office and independent council to maintain accountability, oversight and momentum of diversity in STEM initiatives.

Government has an indispensable role to lead, fund and champion work to deepen diversity in STEM. The ‘guiding hand of Government’ – leveraging its power as a primary funder, policymaker and leader – is essential in this work.

There is merit in creating a new council and office in Government to drive diversity in STEM.

This could fund and coordinate work across Government, industry, research and the non-profit sectors to ‘scale from success’ – and speed diversity advances.

Its work could be overseen by a council of diverse Australian STEM champions with strong leadership stature, public profiles, governance skills, networks and policy literacy. STA’s Superstars of STEM – which already generates many stellar diverse leaders for crucial leadership roles in the service of the nation – is a powerful potential source of talent for diverse appointments to such a council.

The council and office could have a key coordinating role – and act as a champion across the breadth of government and beyond – to accelerate diversity gains. It would need trusted relationships and influence to ensure other policy levers across Government and industry also advance this goal – noting the key roles of the education system, workplace laws and practices, and migration settings in shaping the diversity of Australia’s STEM workforce.

The council could identify priorities and emerging issues, monitor progress on diversity, and involve stakeholders to develop, plan and deliver diversity in STEM initiatives. It would need strong diversity and deep reach into industry; universities, medical research institutes, and publicly funded research agencies; the STEM professions; and the education sector through universities, vocational education and training and the school system.

While such a council would have a welcome broader remit on diversity, it should also maintain a crucial focus on achieving gender equity in STEM. The job is not yet done. The chronic under-representation of women and girls in key STEM fields persists – and it will take continued concerted work to end this inequity.

Potential final recommendation from the Panel:

The Australian Government should establish an eminent council, supported by a new office, to drive gender equity and diversity in STEM. The council should:

- include strong leadership, expertise and diversity from across the STEM sector
- play a coordinating role across government and oversee diversity in STEM initiatives
- advise on policy and legislative changes needed to strengthen Australia’s STEM workforce
- gather insights from stakeholders across government, education, research and industry.

Objective 2

Embed long-term action on diversity across STEM sectors

Draft panel recommendation 2a

Building on recommendations of this review, the Australian Government should create a national strategic approach to diversity in STEM initiatives.

Diversifying Australia’s STEM talent pipeline is key to Australia’s economic competitiveness and prosperity – and to our innovation success. Diversity is key for STEM excellence.



Australia's STEM sector has already contributed significant work, expertise and knowledge in submissions and consultations for the Pathways to Diversity in STEM review. The data and insights collected for this work, and for the Women in STEM Decadal plan and the Advancing Women in STEM strategy, can inform the next phase of Australia's national strategy and policy on diversity in STEM. STA had anticipated the panel's final report would either be such a strategy – or a very strong foundation for such a strategy.

A national strategy on diversity in STEM should articulate the issues and challenges and identify initiatives to address them based on the Diversity in STEM Review. It could set targets and expectations about deepening diversity in STEM to guide Australia's collective progress.

A national strategy could map the many programs and initiatives to remove barriers in STEM education and careers for historically under-represented groups in STEM. Shared visibility of how these initiatives fit together and tackle the complex multi-faceted diversity challenge is key.

However, it should not adopt a 'one size fits all' approach that requires every program or initiative to work uniformly on every aspect of under-representation and diversity in a standardised way. There is an important role for programs that deliver targeted support to diverse groups that face unique challenges – such as existing Indigenous-led programs that support Aboriginal and Torres Strait Islander people in STEM. Such initiatives sit alongside and complement programs like Superstars of STEM that forge connections between diverse women and non-binary STEM talent from a very wide span of diverse backgrounds and demographics in a single program.

Potential final recommendation from the panel:

The Australian Government should publish a national strategy to drive diversity in STEM, overseen by the new Diversity in STEM council. This strategy should:

- **articulate the urgent imperative and rationale to strengthen diversity in STEM**
- **set out a plan – with targets – to deepen diversity, equity and inclusion in STEM**
- **build stronger visibility of how diversity initiatives fit together to strengthen coordination**
- **fund initiatives that combine STEM talent from a wide diversity of backgrounds alongside targeted initiatives that support STEM talent from a single diversity group**
- **draw on previous major national strategies and the evidence generated in this review.**

Panel recommendation 2b

Government funding bodies and STEM-employing organisations should commit to the long-term success of diversity in STEM programs and initiatives.

A long-term commitment from Government and employers is essential to drive diversity in STEM. We must 'stay the course' and 'scale our success' to tackle this complex multi-faceted challenge.

The panel's final recommendation on this should be bolder and more direct.

It should recommend the Australian Government make a new decade-long commitment to fund the existing successful diversity in STEM initiatives evaluated in this review with security of investment.

Enshrining secure funding to these programs for the next decade would build on the strong success of these proven key initiatives – and avoid diverting productivity, time and workloads in reapplying for short-term funding. It would enable successful programs to direct their full energy into a laser-like focus on driving diversity gains.



Evaluation helps to track success, confirm effective interventions, and speed diversity gains. Issuing decade-long funding agreements would give initiatives security, time and resources to gather long-term data and evidence of the impact of initiatives beyond their first few years of operations.

Government has an indispensable role as the foundational funder of such interventions – and it is unrealistic to expect most diversity programs could become financially self-sustaining. This point was clearly made by ACIL-Allen in their independent evaluation:

“There is a clear role for the Australian Government in supporting initiatives like Superstars of STEM, as they are unlikely to be fully-funded through industry-led approaches or solely by individual employers. There is an opportunity for industry to provide financial contributions ...however (they are often) modest and insufficient to fund the full delivery of the initiative without Government funding.”

Potential final recommendation from the panel:

The Australian Government should make a decade-long commitment to fund the existing successful diversity in STEM initiatives evaluated in this review – which found strong evidence of the early success of these initiatives.

Objective 3

Government to incentivise better diversity and inclusion practices in STEM organisations

Panel recommendation 3a

Government grant funding, investment and procurement for STEM-related programs should align with best practice guidelines for inclusion and diversity.

There is an opportunity for the Government to strengthen STEM sector diversity through funding, investment and procurement. It can ensure eligibility rules, program guidelines and reporting require recipients, partners and contractors to take steps to advance diversity in STEM in their own institutions, companies and agencies. As the panel notes, such requirements should be informed by existing Government initiatives such as Closing the Gap.

The Government could consider policy options available under the *Workplace Gender Equality Act 2012* (or potential amendments to the Act) and expand WGEA reporting requirements to include data on broader diversity.

Science & Technology Australia strongly supports the Panel’s recommendation that research grants from federal granting agencies include conditions that ensure fair employment practices do not perpetuate job insecurity. STA has long advocated that Australian Government research grants should include conditions on employment of researchers such as minimum periods of employment – which is an especially acute challenge for early career STEM researchers. This would help to retain Australia’s STEM research workforce by guaranteeing more secure employment to kickstart the careers of our most talented young STEM researchers. Similar requirements could be applied to other forms of government support for research and development, and to procurement contracts.

Potential final recommendations from the panel:

- **The Australian Government should broaden the Workplace Gender Equality Agency's remit to collect data from employers on broader workforce diversity.**



- The Australian Government should model the impact of a Workforce Diversity Tax Incentive, where large organisations required to report data to WGEA could qualify for a tax incentive if they meet minimum staff diversity thresholds.
- The ARC and the NHMRC should require universities and medical research institutes to issue employment contracts to researchers that span the length of the grant, or a minimum of three years, as a condition of grants.

Objective 4

Drive and expand understanding of, and engagement with, the meaning and value of STEM in Australian culture and communities, including the benefits of diversity in STEM

Panel recommendation 4a

The Australian Government should develop and run a formal, long term and measurable national communication and advertising campaign relating to STEM.

Limited community awareness about the urgent need to inspire more Australians into STEM study and careers is a major challenge for our country's economy.

However national Government advertising campaigns are expensive and very rarely effective. With perhaps just a handful of notable exceptions in recent decades, most Government advertising campaigns have limited traction and do not shift behaviours. Creative concepts from highly-paid advertising agencies can spectacularly miss the mark.

Raising public awareness and shifting behaviours is a complex task. To make headway, it typically requires long-term sustained investment, concerted efforts and an array of tools and approaches.

A communications strategy that identifies key target audiences of diverse young people and more effective ways to spur behaviour change could be a more effective use of limited public funding.

Such a strategy could leverage existing initiatives that promote STEM to the public and children, including deploying high-profile confident public speakers and role models from Superstars of STEM.

Some universities have established "Elders in Residence" roles to honour – and remunerate – key First Nations knowledge holders. The Panel could extend this concept and recommend the Australian Government appoint an Indigenous Chief Scientist. Such a role could engage deeply with the breadth and diversity of Indigenous voices and knowledge across diverse First Nations communities.

Potential final recommendations from the panel:

The Australian Government should commission a sophisticated communications strategy to reach key audiences to inspire more young Australians into STEM study and careers.

Such a strategy should build on existing programs and leverage diverse talent and could:

- deploy Superstars of STEM as role models including in targeted social media campaigns to reach key audiences of diverse young people
- expand funding to resource travel and organise more schools visits by Superstars of STEM
- support [DeadlyScience](#) to broaden its schools outreach and STEM resource packs
- support the [Aboriginal and Torres Strait Islander Mathematics Alliance](#) to scale uptake of its successful maths education units that combine maths and culture.
- build on the work of the [Australian Science Media Centre](#), the [Questacon Science Circus](#) and the [CSIRO STEM Professionals in Schools](#) program.



Panel recommendation 4b

The Australian media and entertainment industry should work with relevant academies, STEM peak bodies and not-for-profit organisations to celebrate diversity in STEM. This would involve more accurately representing the diverse people and roles in STEM.

STA would be delighted to help the Government leverage its investment in our successful Superstars of STEM program to further expand visibility of diverse people and roles in STEM.

Superstars of STEM exists to grow the number of diverse STEM experts appearing regularly in the Australian media. Its success is driven by:

- top-quality media training to produce excellent media talent – delivered by STA’s national network of journalists, media trainers and public speaking coaches
- excellent relationships with media outlets, editors and journalists – who know the program is a go-to source of diverse, articulate, confident, engaging STEM experts
- selection processes that reflect the strategic purpose of the program – to propel diverse STEM experts into the media with support and training
- fostering a powerful peer learning and support network among the Superstars who propel each other’s success and career development
- mentoring, media pitching support and access to individual support as needed.

The Superstars of STEM program works effectively with media outlets by responding to their drivers. It develops high quality STEM expert media talents who can respond to existing news stories in the media cycle – or pitch their own stories – to boost STEM diversity in the Australian media.

While the intention of the panel’s draft recommendation is commendable, it is not clear what kind of activities and what kind of collaboration is proposed.

STA, like many other organisations, also provides fee-for-service media training to organisations to prepare their employees (STEM experts) to speak to the media. Whilst not as comprehensive or effective as the Superstars of STEM program, it is an important component in enabling STEM experts to speak to the media. There is generally good access to this type of training for STEM experts.

Potential final recommendations from the panel:

The Australian Government should double investment in the successful Superstars of STEM program to scale its media outreach, expand individual media pitching support and generate more stories in the Australian media featuring diverse STEM experts.

Panel recommendation 4c

All STEM-related sectors should actively include diverse knowledges and representations of diversity in research, publications, education materials and scientific approaches.

Science & Technology Australia strongly supports the Panel’s recommendation that STEM sectors include diverse knowledge in their research, teaching and other activities. In particular, we believe that including Indigenous knowledge in Australia’s contemporary knowledge and practice of STEM is vital to making STEM both maximally relevant to modern Australia as a whole, and as accessible and useful as possible to First Nations people and communities.

Initiatives of the kind recommended are underway in different parts of the STEM sector. For example, the [Indigenous Strategy 2022-25](#) released in 2022 by Universities Australia commits universities to



include in all courses ‘Indigenous content that is meaningful, appropriately developed and appropriately resourced’ and to recognising and promoting the benefits of Indigenous-led research.

Potential final recommendations from the panel:

Together with custodians of diverse knowledge, the Diversity in STEM council should develop best practice guidelines on showcasing diverse knowledge and talent across the STEM sector.

The Australian Government should fund the [National Indigenous STEM Professionals Network](#) to enable a strong network to build capability, facilitate success and collaboration between Indigenous STEM experts and advance First Nations’ work, research, knowledge and practices.

Objective 5

Empower schools and educators to teach STEM thinking and skills, and support pathways to STEM careers for diverse students.

There is strong evidence in the expert literature that one of the most effective ways to support STEM career pathways for diverse students is to give them access to diverse STEM role models. Science & Technology’s Superstars of STEM does exactly this – the program’s diverse cohort of women STEM role models visits schools and demonstrates to school students of all backgrounds that anyone can have a future career in STEM.

One inspiring example is Dr Rashina Hoda, a Muslim woman, software engineer and Superstar of STEM. Through [her outreach work in Muslim schools in Melbourne](#), Dr Hoda has given hundreds of young Muslim girls a glimpse of what their future could hold – pursuing an exciting career in engineering and technology. Dr Hoda is a real-life role model – and we need many more like her.

Panel recommendation 5a

Implementing the 2022 National Teacher Workforce Action Plan should incorporate a strong focus on teaching STEM thinking and skills pathways into STEM.

Science & Technology Australia strongly supports the recommendation that the *National Teacher Workforce Action Plan* should have a strong STEM focus. In particular, Science & Technology Australia supports the Panel’s recommendations related to supporting teachers through trialling new retention initiatives and improving professional development and training, as well as proposals to better support First Nations people – both teachers and students.

While we support in principle the recommendations related to prioritising STEM disciplines in the allocation of places in university initial teacher education (ITE) courses, these proposals may run into some broader issues about how Commonwealth-supported places in ITE are allocated both now and in the future (following Government’s response to the report of the Teacher Education Expert Panel). Places are not currently allocated by the Government to different teaching specialisations, and it does not appear this has been recommended by Government reviews and policy processes in ITE.

Science & Technology Australia also notes the significant issue of ‘out of field’ STEM teaching. Teachers are critical in connecting school students with STEM and are often the first, or sole, means of STEM exposure that students experience. It is vital teachers are well qualified in STEM to deliver the best STEM education to Australian children, and particularly important that low-SES and under-represented groups receive the best possible STEM education. Too many students are currently being taught STEM subjects by teachers without STEM backgrounds or qualifications. More needs to be done to ascertain the scale of this issue – including a nationally consistent requirement that specialisations be listed as part of teacher registration in all States and Territories.



Potential final recommendations from the panel:

The Australian Government should co-design support programs and pathways to attract and retain Aboriginal and Torres Strait Islander teachers.

The Education Ministers' Meeting should consider updates to teacher registration to require a nationally consistent process to record teachers specialisations – a necessary step to properly ascertain the extent of out-of-field STEM teaching.

Panel recommendation 5b

Governments should partner with First Nations people and the education sector to reflect First Nations scientific knowledges in courses. This would include school curriculum support materials, teacher professional development, and vocational and higher education courses.

STA strongly supports the recommendation that governments and the education sector elevate Indigenous scientific knowledge in courses at all levels of the education system. As the Panel observes, there are many resources available that could contribute to this goal. There is some good work already underway in this area, for example work to include Indigenous knowledge in all university courses under the Universities Australia *Indigenous Strategy*.

[AITSL Standards](#) 1.4 and 2.4 speak to teachers' capacity and cultural competency to both teach Aboriginal and Torres Strait Islander students (1.4) and Indigenous content (2.4) and this is included in various forms in universities' initial teacher education courses. There is room for greater consistency of this material across universities – this is something the Panel could explore.

The vital work of [Aboriginal and Torres Strait Islander Mathematics Alliance](#) and [DeadlyScience](#) to support STEM education for Aboriginal and Torres Strait Islander children should be supported. The Panel could consider ways to recommend ongoing funding and support to these successful programs without excessive red tape.

Other efforts include:

- The [CSIRO Indigenous STEM Education Project](#) (this is no longer ongoing).
- The [Aboriginal and Torres Strait Islander Knowledge Curricula](#) project – this work was started by the National Indigenous Australians Agency, and now continued by the University of Melbourne. The project develops resources to embed Indigenous knowledge in school curriculum materials and trains teachers in cultural competency and how to teach Indigenous knowledge.
- Reconciliation Australia's [Narragunnawali program](#) – a broad program in which schools develop Reconciliation Action Plans, which include curriculum materials.
- Cool.org's [Indigenous Education materials](#) – curriculum materials spanning primary and secondary school levels.
- [Australians Together](#) – curriculum and teacher training resources.
- [Know your Country](#) wants funding to employ a First Nations Cultural Educator in every primary school. While not STEM specific, access to a resource like this in every primary school would mean the STEM curriculum would also benefit from Indigenous perspectives.

All these initiatives – ones that improve access for Aboriginal and Torres Strait Islander children, and also work to embed Indigenous knowledge in school curricula, and uplift teachers' capabilities to teach Indigenous content – must work together to achieve this objective.

The central office and independent council (recommended in Recommendation 1 above) could play a useful role in tracking and coordinating this work, noting that it is necessarily spread across different



educational sectors and across jurisdictions, with much of the work being done at a State/Territory level. The central office and independent council would have to establish productive working relationships with peak bodies in each educational sector, as well as education departments in the several States and Territories and the Commonwealth Department of Education.

Potential final recommendations from the panel:

The Australian Government should provide long-term funding to projects and programs that embed Indigenous knowledge in the Australian school curriculum.

The Australian Government should give long-term funding to the Aboriginal and Torres Strait Islander Mathematics Alliance and DeadlyScience to expand STEM access for Indigenous students.

Objective 6

Strengthen perceptions of vocational education and training STEM courses and careers

Panel recommendation 6a

Vocational education and training (VET) providers, industry and other education providers (like schools and universities) should increase collaboration to promote VET-based STEM offerings. This includes promoting streamlined pathways to STEM careers or university STEM qualifications. These communications should reach parents to address parental perceptions of STEM VET education.

STA supports the recommendation to improve promotion of STEM courses in VET, and to improve pathways between sectors and pathways from education into jobs. We also strongly support the recommendation that VET providers, industry and other educational sectors collaborate more to achieve these goals.

We support in principle the recommendation that VET providers should work to improve inclusion and diversity in their courses – and especially the recommendation that this work should be based on evidence and designed for particular providers’ local circumstances and needs.

STA supports the recommendation to do further work to dispel myths and stereotypes about VET study and its outcomes, building on the work of National Careers Institute. It is not clear, however, who the panel has in mind to do this additional work.

Nevertheless, STA believes that this recommendation could be further developed and more thought could be given to the kinds of activities intended. While it is true that a likely outcome of the Australia Universities Accord will be a series of recommendations for better integration of the higher education and VET sectors, it is not yet clear what form these recommendations will take. Nor is it clear what improvements – beyond generalities – the panel expects to arise from the Accord’s recommendations (assuming that they are implemented, and within a reasonable timeframe).

Potential final recommendations from the panel:

The proposed Diversity in STEM council should work with governments and with peak bodies in the higher education and VET sectors to identify opportunities for more effective collaboration.

The council and the proposed central office should monitor recommendations of the Australian Universities Accord and work to develop a forward agenda for further higher education/VET collaboration that builds on changes in tertiary education policy.



Objective 7

Build STEM workforce capability through industry training and diverse engagement

Panel recommendation 7 government should increase horizon-scanning exercises to inform STEM workforce development.

STA supports the recommendation that government and industry should do more to examine future demand for STEM skills to inform workforce development. We note that – on the government side – Jobs and Skills Australia are already doing good work in this area. Of course, it is always possible to do more work – and more sophisticated analysis – of future demand for and supply of STEM skills.

STA strongly supports the proposal that industry do more scenario planning work in this area. We agree that Industry Skills Councils are appropriate bodies to undertake and coordinate this work. There is a role for the proposed independent council (see Recommendation 1 above) to have an oversight or coordinating role in this work, so that the Jobs and Skills Councils' findings can be brought together to provide a perspective for the entire STEM workforce and be shared with Government and other relevant stakeholders.

Potential final recommendations from the panel:

The proposed council should work with Jobs and Skills Australia and Industry Skills Councils to project future demand for STEM workers across the economy.

Objective 8

Support pathways for diverse cohorts into university STEM education

Panel recommendation 8a

Governments and Australian universities should work together towards equity in access, participation and attainment of STEM higher education.

Panel recommendation 8b

Each Australian university should address the barriers to access for diverse cohorts for its STEM courses.

Panel recommendation 8c

The Australian Government should consider opportunities to broaden existing successful initiatives that support gender diversity in university STEM education to other underrepresented cohorts.

Science & Technology Australia strongly supports this recommendation, and again acknowledges the work [ATSIMA](#) and [DeadlyScience](#) do to create access to STEM for Aboriginal and Torres Strait Islander learners and the work of the [National Indigenous STEM Professionals Network](#) to support and mentor university students.

We also reiterate recommendations to strengthen Aboriginal and Torres Strait Islander access to and support at school and university in our [submissions to the Australian Universities Accord](#) process:

- Show Aboriginal and Torres Strait Islander youth a future in STEM: invest in pre-service and in-service teacher professional training that connects the teaching and learning of STEM with First Nations knowledge.



- Ensure bilingual education in Indigenous languages is an integral part of the Australian education system and ensure national education initiatives like NAPLAN can cater for students in this type of education.
- Invest in Aboriginal and Torres Strait Islander people to become STEM teachers.
- Develop clear educational pathways for all Aboriginal and Torres Strait Islander students to go to university regardless of where they come from i.e. rural, remote and urban.

As noted in our Accord submission, the single biggest deterrent to attending university for students from low-SES backgrounds is the cost of supporting themselves in their study years. The Panel could recommend the Government review levels of student income support, particularly those from diverse and under-represented groups.

Similarly, the HECS-HELP loan scheme is the bedrock of equity in Australia's university system. This scheme is available to all Australian citizens, to holders of permanent humanitarian visas, and to some New Zealand citizens resident in Australia (subject to conditions). There are, however, some cohorts resident in Australia – such as asylum seekers on temporary visas – who are not eligible for loans and must pay full fees. This is a major barrier to these potential students accessing university.

Potential final recommendations from the panel:

To support greater access to university by Aboriginal and Torres Strait Islander people, the Australian Government should:

- Invest in pre-service and in-service teacher professional training that connects the teaching and learning of STEM with First Nations knowledge.
- Invest in all levels of education with targeted programs to support Aboriginal and Torres Strait Islander learners – including pathways to university and support at university.
- Ensure bilingual education in Indigenous languages is an integral part of the Australian education system and ensure national education initiatives like NAPLAN can cater for students in bilingual education.
- Invest in Aboriginal and Torres Strait Islander people to become STEM teachers.

To support other under-represented groups to access university, the Australian Government should:

Determine the specific barriers to access faced by specific under-represented groups and develop measures to address them. These barriers can include:

- Potential students on temporary protection visas are not able to access the HECS-HELP system, which presents a cost barrier to accessing university.
- Low-SES students face a significant deterrent in meeting living costs while attending university. The Government should review levels of income support provided to students to ensure that taxpayer support for students goes to those who need it most, at an appropriate level to support their living costs.
- Some diverse communities need more visible role models for girls to consider pursuing a STEM career. The Government should expand outreach efforts to reach these communities in culturally appropriate ways.



Issues of access to university for under-represented groups are central to the Australian Universities Accord. Efforts to widen access to STEM courses should build on the Accord's work on access to higher education in general.

The Government and universities should work together to ensure that Indigenous students, and students from other under-represented backgrounds receive appropriate and culturally relevant support during their studies.

Objective 9

Implement incentives and accountability mechanisms in STEM-employing organisations to increase diversity and inclusion.

Panel recommendation 9a

STEM-employing organisations and governments should apply policies like anti-bullying and harassment, flexible work and pay transparency to create safe and inclusive environments. They should invest in programs to accelerate progress for underrepresented groups, like career development, fellowships, job customisation or mentoring.

Panel recommendation 9b

STEM-employing organisations and governments should adopt or strengthen accountability mechanisms for middle and senior leaders to effectively implement policies and programs that accelerate change and inclusion.

Science & Technology Australia supports the principle of these recommendations. The Panel could consider the practicality and feasibility of how this would be introduced in organisations across the public and private STEM sectors and determine the available policy levers to make this happen.

All workplaces must comply with relevant legislation on workplace health and safety and anti-discrimination. Moving beyond minimum legal requirements to instil meaningful cultural change requires deep commitment across all levels of organisations. Leadership must also have a willingness to resource programs including mentoring, fellowships, internships etc.

If the willingness is there, programs like [SAGE](#) and the [Champions of Change Coalition](#) can effectively support organisations to make cultural change, but they require long term commitment from organisations.

It is challenging to identify policy levers available to the Government to incentivise this behaviour. As noted in response to Panel recommendation 3a, the Government could consider policy options available under the *Workplace Gender Equality Act 2012* and expand WGEA reporting regimes could be expanded to include different forms of diversity.

Potential final recommendations from the panel:

The proposed Diversity in STEM office should publish best practice policies to prevent bullying and harassment – and promote safe and inclusive workplaces.

The Australian Government should broaden the Workplace Gender Equality Agency's remit to collect data from employers on broader workforce diversity.

The Australian Government should model the impact of a Workforce Diversity Tax Incentive, where large organisations required to report data to WGEA could qualify for a tax incentive if they meet minimum staff diversity thresholds.



Objective 10

Support career pathways for diverse cohorts and recognise efforts to advance inclusion and diversity.

Panel recommendation 10a

All STEM-employing organisations should develop a recruitment and promotion system for STEM positions that attracts, retains and promotes employees from underrepresented, including intersectional, cohorts.

Science & Technology Australia supports the principle of this recommendation. The Panel could consider the practicality and feasibility of how this would be introduced in organisations across the public and private STEM sectors and if there are any available policy levers to make this happen.

The work of [iSTEMCo](#) in supporting diverse STEM talent gain experience and mentoring support in the Australian STEM sector is an excellent example of how women and other under-represented minorities can be supported to succeed in their careers.

Potential final recommendations from the panel:

The Australian Government should support programs that have a proven track record in supporting migrants and people from diverse backgrounds gain work experience and employment in the Australian STEM industry.

The proposed Diversity in STEM Council could work with STEM employers to publish recruitment practices that are inclusive and focus on applicants' ability to do the job – including specialised recruitment rounds for under-represented groups.

Panel recommendation 10b

The Australian Government should do a detailed analysis of how overseas STEM qualifications are recognised in Australia.

This would be a useful exercise that could improve industry awareness and understanding of overseas qualifications. The Panel could consider how Jobs and Skills Australia could contribute to this.

A parallel issue is the level of understanding amongst employers of the work rights of visa holders. Overseas students who have completed STEM qualifications in Australia are facing barriers entering the STEM workforce on post study visas, due in part to employer's lack of knowledge about these visas. These potential employees are lost to the Australian workforce, as they return to their home countries or move elsewhere overseas, or they are underemployed in Australia in non-STEM jobs such as retail. Educating STEM employers about post study work rights of overseas students could reduce this loss of STEM skilled workers.

Potential final recommendations from the panel:

The Australian Government should commission Jobs and Skills Australia to work with accreditation agencies and industry peak bodies to strengthen employers' understanding of overseas STEM qualifications.



Objective 11

Improve recognition systems and job security to attract and reward diverse STEM researchers in academia.

Panel recommendation 11a

Australia should follow the lead of other countries, such as the Netherlands and the UK, to change the recognition, reward and research systems we use to assess the performance of STEM researchers.

Science & Technology Australia supports looking to best practice globally to support recognition and career progression, noting the work commissioned by the Office of the Chief Scientist on research metrics that is due for release soon.

Science & Technology Australia supports the Panel's recommendation that the Government adopts Recommendation 4 from *Trusting Australia's Ability: Review of the Australian Research Council Act 2001*. Science & Technology Australia also strongly supports the Panel's other recommendations:

- that minimum researcher terms be more closely linked to research grant lengths – this would ensure greater certainty and security for Australia's STEM researchers.
- to support PhD students with improved conditions and remuneration – Science & Technology Australia also advocated for an increase to the minimum PhD stipend in our submission to the Universities Accord.
- to encourage greater mobility between academia and industry – improved systems in the university and broader STEM research sectors for recognition and reward that value experience from different areas would help mobility across the STEM sector.

Potential final recommendations from the panel:

The Australian Government should introduce conditions to research funding grants that require organisations to offer employment contracts for people employed under that grant to have a contract for the full grant length.

As proposed in Science & Technology Australia's [submissions to the Australian Universities Accord](#) process, recommendations to improve Aboriginal and Torres Strait Islander people's access to and success in university research include:

- **Invest in the development of a National First Nations STEM Network for First Nations people who are working or being educated in STEM.**
- **Require universities to develop relationships with Indigenous communities to develop programs in Indigenous-led, community-driven research where benefits of the research flow back to community.**
- **Create dedicated funding streams: The ARC and NHMRC should create funding streams to forge meaningful relationships with First Nations communities, promote Indigenous-led and community-driven research, protect Indigenous intellectual property and develop potential business/employment opportunities on Country to strengthen Country.**
- **Create First Nations STEM careers: that support the values of First Nations Communities and work towards a sustainable future for all Australians**

The proposed independent council should consider options for improved recognition and reward systems, informed by the review of research metrics.



Draft recommendations for Women in STEM programs

Superstars of STEM

The draft report writes: *“This mentorship and media training initiative **seeks to address** underrepresentation of women STEM experts in the Australian media. It does this by building a critical mass of high-profile women and non-binary role models in STEM and giving them communications training and media opportunities.”*

STA proposes the final report use the following description of the program:

“Superstars of STEM is a highly-successful Australian media visibility initiative creating a critical mass of diverse women and non-binary STEM leaders with strong media and public profiles. It accelerates careers of diverse STEM leaders with media training and support, public speaking, leadership development, career coaching, mentoring, and schools outreach visits which demystify STEM careers and inspire more young Australians into STEM. The program is a central resource and supplier of talent for other diversity in STEM initiatives.”

Superstars of STEM is a foundation stone in Australia’s efforts to improve STEM workforce diversity.

Since 2017, Superstars of STEM has created 210 diverse visible powerful role models of women and non-binary leaders in STEM who appear regularly in the Australian media, on stage and on screen. It has generated more than 7,000 media appearances by diverse role models in STEM, reached a global audience of 83 million and social media audiences of 5.2 million, and demystified STEM careers for more than 67,000 Australian kids at 487 schools. The program has vast reach across Australia, showcasing women and non-binary role models with successful STEM careers to school children, their parents, teachers and other influencers of career choices.

Without the Superstars of STEM program, media outlets and journalists would struggle to find diverse talent for their articles and TV shows, teachers would struggle to find diverse STEM experts to inspire their students, and equity programs would struggle to find mentors, judges, panel members and speakers for their work to improve diversity. The Superstars of STEM program not only makes diverse women and non-binary people more visible – it also provides them with the skills and confidence to step into the spotlight and serve the nation in an array of STEM leadership and diversity initiatives.

The Superstars of STEM program equips people with career-accelerating skills for life. The program has a philosophy of helping participants to find their own authentic way to raise their public profile and become a role model. This approach enables genuine participation in the program and long-term commitment to being a visible role model. Many participants continue to visit schools, pursue public speaking and act as media commentators long after their 2 years in the program.

STA proposed recommendations for Superstars of STEM:

1. The Superstars of STEM program has had strong early success in creating high-profile public role models of diverse women and non-binary STEM experts appearing regularly in the media. The Australian Government should fund the Superstars of STEM program for the next 10 years to drive long-term diversity in STEM expert voices in the Australian media.

2. To further scale the success of Superstars of STEM, the Australian Government should double operational funding for Superstars of STEM to scale the program’s outreach to media outlets and young Australians in schools. Additional resources should fund:

- **more media pitches to a broader range of media outlets**



- expanded outreach to Australian school students, including travel funds to have Superstars visit more regional and remote schools
- boosted social media reach
- additional tailored support for cultural/gender identity groups with unique needs.
- long-term program evaluation to track the impact of the program over the next decade.

Response to the draft recommendations

Panel draft recommendation 1

- Superstars of STEM helps increase capacity of STEM professionals to engage in the media and boost their profile as role models. There is a need for longer-term measurement to show long-term impact of the initiative on career choice and retention among the target cohort.

Superstars of STEM has led the way for Australian diversity in STEM programs with its deep commitment to evaluation since inception.

The program has collected data on all participants since it started in 2017. This was two years before the evaluation of equity programs was recommended by the Women in STEM Decadal Plan. STA published an impact report after the initial pilot program – and publishes new data [every 6 months](#).

In early 2022, Science & Technology Australia released a 46-page [comprehensive evaluation on the 2021 Superstars cohort](#) to share deeper insights on the program’s effectiveness. It found strong evidence from teachers about the effectiveness of schools visits by Superstars of STEM. 94% of teachers said a visit from a Superstar of STEM influenced their students’ subject choices.

Superstars of STEM has run for six years – and has had a strong commitment to data collection since inception. This evidence shows the powerful career-accelerating effect of the program for diverse STEM leaders (see the case study below).

To enable long-term measurement, the program needs long-term funding.

This would enable tracking of the long-term impact of the program on participants, teachers, students and media coverage in the years after program participation by maintaining contact after the initial engagement.

Panel draft recommendation 2

- Science and Technology Australia (STA) should explore opportunities for greater industry engagement to deliver the program. This includes support for upcoming leaders in STEM industry and self-sustaining models to support longevity.

Science & Technology Australia is deeply grateful to the excellent industry partners that have supported Superstars of STEM since the program began. They include Google, GE Australia, the Department of Defence, the Australian Science Media Centre, STEM Matters and The Conversation.

STA would be delighted to attract additional industry partners for this successful program, but it takes considerable staff time to forge such new relationships and to secure and renew financial support every year. This takes staff away from their direct work with Superstars. Such relationships are also subject to key personnel turnover risk and downturns in companies financial results and priorities. While our current industry partners make their investments as part of their values and good corporate social responsibility, other firms take a different approach.

Seeking funding exclusively from industry runs the real risk of programs losing their independence and being influenced to comply with company goals, including potentially limited perspectives on diversity. While contributions from industry may deliver beneficial top-up funding, or allow for a



specific targeted rollout of the program, it is unrealistic to expect base funding could rely on industry funding alone.

Superstars of STEM faces an additional difficulty in securing operational corporate funding due to the nature of the main focus on media participation. Corporate funders often predicate their funding of equity programs on their own employees being able to benefit from the program. The requirement for Superstars of STEM participants to do media interviews is a barrier to participation in many corporate organisations where only the CEO or senior executives are allowed to speak to the media.

Since 2017, 63% of Superstars have been STEM researchers, 20% work in the public sector, 12% from industry and 5% work in non-profit organisations.

The ACIL-Allen independent evaluation cautions that it is unrealistic to expect that industry support would ever fully cover the operational costs of such programs in a fully self-sustaining model:

“There is a clear role for the Australian Government in supporting initiatives like Superstars of STEM, as they are unlikely to be fully-funded through industry-led approaches or solely by individual employers. There is an opportunity for industry to provide financial contributions ...however (they are often) modest and insufficient to fund the full delivery of the initiative without Government funding.”

We do not support this draft recommendation – and invite the panel to rethink it.

Panel recommendation

- [STA should also consider how the program can best complement other initiatives. It should also consider expanding media liaison to represent diversity in STEM beyond gender.](#)

Superstars of STEM interacts with a vast array of other STEM education and outreach programs – most with an equity focus, and/or a diversity lens on their work. These include:

- [DeadlyScience](#)
- [Fizzics Education](#) – podcast and conferences
- [Curious Minds](#) – talks and mentoring
- [It Takes a Spark STEM Conference](#)
- [YoWIE \(Young Women in Engineering\)](#)
- [CSIRO STEM Masterclass](#) and careers webinar series
- [Little Scientists Australia](#) – education conferences
- [Future You](#) campaign and resources
- [Ardoch Magnify](#) program
- [Sydney Science Festival](#)
- [WINGS](#) (Women in Engineering and Computer Science)
- [Google Girls in STEM Day](#)
- [Australian Council for Educational Research](#) – video for high school students
- [STEM Women](#)
- [STELR](#)

STA actively works with programs that place scientists in schools to enable these programs to meet their own diversity goals by providing them with access to more women and non-binary scientists. We have a request form on our website to enable other organisations to request speakers for their events. We get a variety of organisations making requests through this portal such as conferences, community groups, local libraries, and businesses.



Although Superstars of STEM is designed to support women, and also non-binary people from the 2023 cohort, the program has strong diversity – across many different dimensions – built into its design. Superstars of STEM cohorts include women and non-binary people of all ages, career stages, various language, cultural and ethnic backgrounds, with disability, from regional and rural areas, and Indigenous Australians. These diverse cohorts, and build powerful networks that share stories and learn from others’ varied experiences – with the common thread of working to build women’s and non-binary peoples’ profiles as STEM experts in the media. Bringing together people from an array of backgrounds, to share their different and unique experiences powerfully compounds the development and confidence the Superstars of STEM formal training builds.

STA creates connections between groups of Superstars with similar lived experiences and delivers additional support. For example, in February 2022 all the Indigenous Superstars had a group mentoring session with Dawn Casey, Tagalaka traditional owner from North Queensland and Deputy CEO at the National Aboriginal Community Controlled Health Organisation (NACCHO).

Up-scaling the program to separately target other under-represented groups in STEM could be a consideration, if adequately resourced. However, focussing only on single minority groups, runs the risk of ‘siloining’, and losing the rich learning that a diversity of backgrounds and experiences brings to the cohort. The current approach also acknowledges the effects of intersectionality and enables deeper support – and understanding of this – across the cohort.

FINAL REPORT CASE STUDY: SUPERSTARS OF STEM

In its first six years, it has generated more than 7,000 media appearances by diverse role models in STEM, reached a global audience of 83 million, and demystified STEM careers for more than 67,000 Australian kids at 487 schools. It has also fast-tracked the careers of 210 diverse STEM leaders – helping them to win awards, secure promotions, and move into senior leadership in Australian STEM.

Superstars of STEM is a game-changing Australian initiative to smash gender assumptions about who can work in science, technology, engineering and maths – and inspire more young Australians into STEM. Created by Science & Technology Australia in 2017, it has already made a powerful contribution to tackling the serious gender inequity of visible diverse STEM role models in the media as authoritative expert voices. Role models are crucial to tackle under-representation – and to shape perceptions among young people, parents and teachers – as expert evidence confirms.

Tackling the challenge that ‘it’s hard to be what you can’t see’, the program is creating a critical mass of diverse high-profile women and non-binary scientists appearing regularly in the Australian media to inspire our next generations of young Australians into STEM study and careers. 94% of teachers said a visit from a Superstars of STEM influenced their students choice of subjects.

Superstars of STEM sits at the very heart of Australia’s diversity in STEM programs – and is a central resource that powers a wide array of diversity in STEM programs and initiatives. The ACIL-Allen evaluation found it ‘operates as a resource for other initiatives and the sector more broadly, providing visibility of and access to well-trained articulate public figures in STEM careers’.



In 2023, there are 5% Aboriginal and Torres Strait Islander Superstars, 28% who are people of colour, 21% who speak a language other than English, 20% are LGBTQIA+, 18% rural, 3% with a disability, and 3% non-binary.

Media visibility fast-tracks career success. Every six months, at least half of the current Superstars experience career progression such as being promoted or offered a new job with a higher salary. Three in four employers say the program has advanced the career of their Superstar employee.

Superstars of STEM is a world-leading program that is powerfully changing public perceptions of what a scientist looks like, inspiring the next generation of STEM students, and turbo-charging the careers of diverse Australian STEM experts to serve the nation.

Superstars of STEM supports a vast array of other diversity in STEM programs including: Fizzics Education, Curious Minds, 'It takes a Spark' conferences, YoWIE (Young Women in Engineering), CSIRO STEM Masterclass and careers webinar series, Little Scientists Australia, Future You, Ardoch Magnify program that supports schools in low-SES communities, Sydney Science Festival, WINGS (Women in Engineering and Computer Science), Google Girls in STEM day, Australian Council for Educational Research, DeadlyScience, STEMWomen, STELR schools outreach and Elevate.

