SCIENCE & TECHNOLOGY AUSTRALIA POLICY SUBMISSION

24 OCTOBER 2024

SENATE COMMITTEE ON EDUCATION AND EMPLOYMENT INQUIRY INTO THE BETTER AND FAIRER SCHOOLS (FUNDING AND REFORM) BILL 2024

Science & Technology Australia thanks the Committee for the opportunity to provide input to the inquiry into the Better and Fairer Schools (Funding and Reform) Bill 2024.

Science & Technology Australia is the peak body for the nation's science and technology sectors, representing 140 member organisations and more than 225,000 scientists and technologists. We connect science and technology with governments, business and the community to advance science's role in solving some of humanity's greatest challenges.

Australia's education system needs measures that ensure it is well resourced to support students to learn the skills they need for the future, and for teachers to thrive in their critical roles supporting students to reach their full potential. At the same time, it's critical to ensure that teachers – the backbone of Australia's education system – are adequately trained with the specific specialist knowledge needed to give students the knowledge and skills they need for the future.

Science & Technology recommendations

1. The Australian Government must work with states and territories to implement a national approach to recording teachers' specialisations through teacher registration processes.
2. Alongside meaningful school funding reform measures, the Australian Government must take steps to support programs and initiatives to solve the urgent challenge of out-of-field teaching across STEM subjects in secondary schools across Australia – e.g. a national program to upskill current out-of-field maths teachers.

Ensuring Australia's future workforce is equipped with necessary STEM skills

Australia's future is dependent on a highly trained, agile and deeply capable STEM workforce. In 2022, jobs requiring STEM skills were projected to increase by 14.2% by 2026 – more than twice the increase in non-STEM jobs.

Preparing this future workforce starts in school. Australia needs a strong, inspiring and deep STEM curriculum that engages students and gives them the skills, motivation and confidence to pursue STEM careers. Alongside this, we need well-resourced and well-trained teachers to deliver the deep understanding and competencies the jobs of the future will require.

Enrolments in intermediate and higher-level maths, as well as physics – subjects that provide a critical foundation for a highly skilled STEM workforce – have shown a slow but steady decline over the past decade.

Additionally, nation-wide teacher shortages mean students across the country are being taught maths and science by teachers without training in these specialist subjects. Secondary school teachers have specific areas of expertise, training which is essential to ensuring they can instil the deep understandings of specific subject knowledge in students. However, data from the Australian Institute

for Teaching and School Leadership 2021 National Teacher Workforce Characteristics Report indicates 40% of teachers currently teaching maths, and around 29% of those teaching science, lack specific training in the specialist subject matter, how to teach it, or both. This puts undue pressure on a teaching workforce already under strain.

Part of the issue is mapping the exact extent and nature of the problem. New South Wales is the only jurisdiction to record teachers' specialisations as part of the teacher registration process. An essential first step in solving this challenge is to implement a national approach to recording teachers' specialisations to enable an accurate and comprehensive assessment of the extent of out-of-field teaching across the country.

Science & Technology Australia Recommendation 1:

The Australian Government should work with states and territories to implement a national approach to recording teachers' specialisations through teacher registration processes.

Science & Technology Australia welcomes increased funding for schools to ensure they are equipped to deliver quality education to all Australian students, regardless of their backgrounds or where they live. At the same time, the Australian Government must use every lever available to ensure our education system is providing students with the deep STEM foundation critical to deliver Australia's future workforce.

As part of funding reform, the Government should also ensure our education system is meeting students' needs and delivering the skills our future workforce will require. Ways to support these goals should be considered when developing renewed funding agreements. One such way is to work with states and territories to deliver a national program to upskill current out-of-field maths teachers (Appendix 1).

Science & Technology Australia Recommendation 2:

Alongside meaningful school funding reform measures, the Australian Government should take steps to support programs and initiatives to solve the urgent challenge of out-of-field teaching across STEM subjects in secondary schools across Australia – e.g. work with states and territories to deliver a national program to upskill current out-of-field maths teachers.

Please do not hesitate to be in touch if we can be of any further assistance to the Committee as it considers this important bill.

Professor Sharath Sriram
President
Science & Technology Australia

Ryan Winn
Chief Executive Officer
Science & Technology Australia

Appendix 1: A national program to upskill out-of-field maths teachers

A National Secondary Mathematics Teacher Upskilling Program

A proposal from a consortium comprising the Actuaries Institute, the Australian Mathematical Sciences Institute, the Australian Mathematical Society, the Mathematics Education Research Group of Australasia and the Statistical Society of Australia. The consortium seeks to raise awareness of the acute challenge of out-of-field maths teaching, and advocate for a viable solution though policy reform and a national upskilling program. The consortium has developed a framework for a viable program , but there is further work to be done to determine specific operational details – the consortium would be happy to work with a Government working group or similar to progress this proposal further.

Consortium lead: **Professor Merrilyn Goos**, University of the Sunshine Coast, President-Elect, International Commission on Mathematical Instruction mgoos@usc.edu.au
With **Professor Tim Marchant**, Director, Australian Mathematical Sciences Institute
director@amsi.org.au

Justification and Need

- Two in five secondary school maths teachers are out-of-field (OOF)– i.e. not trained to teach maths.
- Up to 75% of Australian Year 7–10 students are likely to experience OOF maths teaching.
- The scale of out-of-field teaching in mathematics in Australia is enormous and cannot be repaired solely by recruiting more teachers.
- Disadvantaged students are more likely to be taught by OOF teachers: only 31% of Year 8 students in low SES schools are taught by fully qualified maths teachers compared with 54% of Year 8 students in high SES schools (TIMSS 2019).
- Students taught by OOF teachers have lower academic achievement: Year 8 students taught by OOF maths teachers scored lower on TIMSS 2019 (511) than those taught by fully qualified teachers (531).
- There is no consistent, large-scale approach, nor sufficient resourcing, to upskill OOF maths teachers.
- There are several, small-scale courses available to upskill OOF maths teachers, but they vary widely in content, duration, and cost, and can be challenging for teachers to access.

Program Description and Scope

This Program would deliver a nationally consistent framework for a postgraduate course to upskill OOF maths teachers. It would be jointly designed by experts in maths and maths education and delivered by a consortium of universities rather than a single institution. This approach:

- encourages collaboration and networking between institutions
- stabilises the program and delivers at the scale required
- provides uniform and portable qualifications

- provides a platform for the creation of fit for purpose content
- allows enrolment in “home” institutions with access courses offered across the partnership
- guarantees easy access to OOF teachers across Australia.

Specifically, the Program will**:**

- be a part-time, 8-subject, **Graduate Diploma** program that upgrades OOF teacher qualifications to the same level as fully qualified mathematics teachers
- be structured to allow for staged entry or early exit via a 4-subject Graduate Certificate
- be offered in blended mode, combining online and in-person delivery
- accept an anticipated intake of around **500 OOF maths teachers per year** initially over four years (500 OOF teachers per annum is indicative pending more detailed data collection).

Program costs would be shared between the Commonwealth and state and territory jurisdictions.

Such a **nationally consistent upskilling program** will ensure Australia’s students – and future workforce –receive a solid foundation in mathematics, taught by confident and expert teachers. The program will provide the necessary **scale, uniformity and resources** to tackle the OOF maths teacher problem.

Content

To be fit for purpose, an upskilling program needs to meet the mandatory content requirements specified by AITSL for accrediting initial teacher education programs. As such, the Graduate Diploma delivered through this program would require:

- ***Mathematics***: 6 semester-long university subjects, with no more than 2 at first-year level and at least 2 at third-year level.
- ***Mathematics curriculum and pedagogy***: At least 2 semester-long university subjects.

Implementation and roll out

Jurisdictions should be encouraged to direct resources to fully fund participants in areas and schools where there is greatest need. Out-of-field teaching is more prevalent in regional, rural, remote, and low-SES areas, so these areas would be the logical place to prioritise if funding is limited.

To ensure maximum benefit and return from the funding investment, education jurisdictions could consider the following requirements for fully-funded program graduates:

- A commitment to stay in their schools for a defined period (e.g., three years)
- A commitment to (re)pay fees/HECS-HELP if they fail to complete the program or default on their obligations (with exemptions on a discretionary basis as needed).

To ensure that teachers fully benefit from the program, in-school and systemic supports would be needed. Education jurisdictions and schools would need to provide:

- some release time from teaching and administration duties
- in-school or online mentoring from more experienced in-field mathematics teachers
- recognition of the program qualifications by school leaders and by teacher registration authorities.

Program effectiveness would be monitored via surveys of graduates and collection of nationally consistent data on teachers’ subject-specific qualifications.