

Parliamentary Friends of Engineering

Roundtable: Maths in schools

Parliamentary Friends of Engineering Co-Chairs:

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Senator the Hon Bridget McKenzie, Shadow Minister for Infrastructure and Transport, Shadow Minister for Regional Development, Local Government and Territories

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This policy document is the synthesis of the discussion from a Parliamentary Friends of Engineering Roundtable of Parliamentarians and sector experts, held at Australian Parliament House, 31 March 2026.

Australia faces a deepening crisis in maths participation and capability

Against the backdrop of increasing geopolitical uncertainty and competition, there is increasing demand for technically skilled workers. Australia relies on migration to fill critical skills gaps but we also need to increase the pipeline of our domestically educated workforce.

Maths literacy, and deep maths capability underpins the technical skills and jobs Australia needs now and in the coming decade to meet national and global challenges. Australia's current productivity is also compromised by low levels of numeracy across the workforce.

Australia's maths capability is under threat from:

- Declining participation in advanced maths. Only 8.4% of Yr 12 students – a record low – are currently taking advanced maths
- Widespread teacher capability gaps and the systemic out-of-field teaching problem
- Inequitable access to advanced maths, particularly for girls, low-SES students, First Nations students, and those in regional and rural areas
- Negative cultural attitudes toward maths, which suppress participation more than ability does
- Weak connections between schools, universities, and industry

Failure to address these challenges will have serious implications for national workforce capacity, productivity, and sovereign capability in engineering, infrastructure, energy, and defence.

Teacher expertise is the single most powerful lever

Well-prepared maths teachers are the most effective single intervention available to policymakers. Many schools, particularly in regional and remote areas, either cannot offer advanced maths subjects due to a lack of qualified staff, or must rely on teachers delivering content outside their area of specialisation. This structural problem is not a reflection of teacher quality or effort; it is a systemic failure of workforce planning and professional support.

Effective maths teachers require both deep subject-matter knowledge and strong pedagogical understanding, including the ability to diagnose student thinking in real time. Professional development programs that address both dimensions, rather than only content knowledge, are most effective.

Equity gaps are structural, not incidental

International assessment data (PISA) reveals persistent and significant gaps in mathematical literacy between demographic groups: boys outperform girls; high-SES students outperform low-SES students; non-First Nations students outperform First Nations students; and metropolitan students outperform those in regional and rural areas. These gaps do not reflect differences in innate ability – they reflect unequal access to resources, qualified teachers, and aspirational pathways.

Evidence from high-performing international systems suggests that reorienting curriculum design around competency and mastery can meaningfully improve equity outcomes. Multiple entry points into advanced mathematics, including summer schools and flexible or online learning pathways, are also important tools.

Culture and identity shape participation

Australia tolerates a level of poor numeracy that it does not accept for literacy. Students who claim they 'can't do maths' face little social stigma, while the same statement about reading would be treated as a problem requiring intervention. This cultural norm enables disengagement, particularly among students who experience early setbacks.

Maths confidence and identity are often formed as early as primary school. Many primary school teachers do not self-identify as maths teachers. Ensuring these teachers are confident in teaching maths will translate to stronger student outcomes – this is a critical and currently underfunded intervention.

Industry–school connections are underdeveloped

Industry engagement with young people – typically at the tertiary education stage – occurs too late to meaningfully influence subject selection decisions made in Yrs 9 and 10. Research indicates that students require repeated, meaningful exposure to STEM career pathways (approximately six to eight times) to develop genuine interest. Earlier and more sustained engagement between engineering and technology firms, and secondary schools is needed to inspire students and increase awareness of potential careers. That way, maths finds meaning beyond the classroom.

Practical programs connecting maths to real-world applications – in infrastructure, climate, motorsports, and other fields – can have strong positive impacts on student motivation, particularly among girls. Visible role models, especially women in technical fields, play a very important role.

Policy options for consideration

1. Establish a National Mathematics Teaching Workforce Strategy

- Require comprehensive and consistent national data collection on the teaching workforce, including subject specialisations at registration and when professional development has been undertaken, to provide an accurate baseline for workforce planning.
- Drawing on best practice from global examples, develop a nationally coordinated professional development program with a sustained focus on upskilling teachers who are delivering maths outside their primary specialisation – framed as workforce development, not remediation.

2. Reform curriculum and assessment to create more flexible and integrated curriculum experiences and pathways

- Review ACARA curriculum frameworks to and focus on mathematical competency, problem-solving confidence, and real-world application.
- Integrate maths and science curriculum more substantively, reducing the current structural fragmentation that limits students' ability to see connections between disciplines.
- Create multiple and flexible pathways into advanced maths at Yrs 11 and 12 to accommodate different learning timelines and enable re-entry after earlier disengagement.

3. Address mathematics equity gaps systematically

- Target additional resources – including qualified teachers, digital infrastructure, and enrichment programmes – to schools in low-SES, regional, rural, and remote communities where access to advanced maths is currently most constrained.
- Ensure all schools are adequately funded and resourced to deliver a high-quality education across all subject areas to all students.

- Expand access to summer school programs and online learning options that allow students to access advanced maths content regardless of their geographic location or the staffing constraints of their school.

4. Invest in mathematical culture change

- Support national campaigns to address the social normalisation of maths avoidance and reframe mathematics as an accessible, valuable, and culturally positive pursuit.
- Increase support for primary school teacher professional development in maths, including addressing maths anxiety, to improve students' foundational experiences.
- Leverage existing public role models in maths and engineering to sustain a broader cultural shift in how maths is perceived by young Australians.

5. Strengthen school–industry–university partnerships

- Encourage engineering, infrastructure, technology, and resources companies to engage with secondary schools, rather than focussing industry outreach exclusively at the tertiary level.
- Support the development of structured, repeated school-industry engagement programs that demonstrate to students real-world maths applications across sectors including energy, infrastructure, defence, and critical minerals.
- Facilitate university engagement directly with schools – including mentoring, campus visits, and collaborative problem-solving programmes – to demystify higher education and widen students' sense of possibility.

Addressing Australia's maths participation and capability crisis requires coordinated action across government, the teaching profession, universities, and industry. The evidence base is compelling – what is needed now is political will, sustained investment, and a nationally coherent strategy.

Parliamentarian attendees

Hon Dr Andrew Charlton	Cabinet Secretary, Assistant Minister for Science, Technology and the Digital Economy, Member for Parramatta
Mr Garth Hamilton	Shadow Assistant Minister for Energy Security and Affordability, Member for Groom
Senator the Hon Bridget McKenzie	Shadow Minister for Infrastructure and Transport, Regional Development, Local Government and Territories, Senator for Victoria
Ms Jess Teesdale	Member for Bass
Mr David Smith	Member for Bean
Ms Zaneta Mascarenhas	Member for Swan
Mr Julian Leeser	Shadow Education Minister, Member for Berowra
Senator Michelle Ananda-Rajah	ALP Senator for VIC

Sector expert attendees

Prof Merrilyn Goos	Emeritus Professor, University of Queensland	Mathematics Education Research Group of Australasia
Ms Gemma Daley	Head of Media and Government Affairs	Australian Industry Group
Mrs Paula Taylor	President; Recipient, PM's Prize for Excellence in Teaching in Primary Schools	Australian Science Teachers Association
Prof Katie Makar	President	Mathematics Education Research Group of Australasia
Mr Allan Dougan	Chief Executive Officer	Australian Association of Mathematics Teachers
A/Prof Adam Piggott	Associate Professor	Mathematical Sciences Institute, ANU
Mr John Manders	Principal	Campbell High School, ACT
Ms Yuka Saponaro	Maths Teacher	Melba Copland Secondary School, ACT

Ms Romilly Madew	CEO	Engineers Australia
Rear Admiral (Retd.) Katherine Richards	Chief Engineer	Engineers Australia
Mr Simon Santow	Head of Government Relations	Engineers Australia
Ms Caitlin Buttress	Acting General Manager, Policy and Advocacy	Engineers Australia
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Prof Kylie Walker	Chief Executive Officer	ATSE
Mr Peter Derbyshire	Deputy CEO	ATSE
Dr Alison Every	Director, STEM Careers	ATSE
Mr Graham Stock	STEM Education Manager	ATSE
Mr Ryan Wynn	Chief Executive Officer	STA
Dr Sarah Tynan	Director of Policy and Government Relations	STA
Ms Jas Chambers	President	STA
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Ms Virginia Anderson	Regional Head ANZ, SJ Group	Consult Australia
Mr Ryan McManus	ACT Regional Manager, Beca	Consult Australia
Ms Lauren Sprint	ACT Lead, AECOM	Consult Australia
Mr Greg Kane	President and Managing Director, Australia, WSP	Consult Australia
Prof Tim Finnigan	President, ACED & University of Tasmania, Head of School (Engineering)	ACED
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Prof Aaron Quigley	Dean, ANU, College of Systems and Society	ACED
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Prof Yiannis Ventikos	Dean, Monash University, Faculty of Engineering	ACED

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