

# RELIEVING OUT OF FIELD TEACHING IN AUSTRALIAN SECONDARY MATHEMATICS

## Endorsement Letters

The Australian Academy of Technological Sciences and Engineering (ATSE)

The Australian Bureau of Statistics (ABS)

Australian Council of Deans of Science (ACDS)

The Australian Institute of Physics (AIP)

The Computing Research and Education Association of Australasia (CORE)

Engineers Australia

The Royal Australian Chemical Institute (RACI)

Science & Technology Australia

[AMSI.ORG.AU/RELIEVING-OUT-OF-FIELD-TEACHING](https://amsi.org.au/relieving-out-of-field-teaching)

## ATSE endorses findings on improving out-of-field maths teaching

The Australian Academy of Technological Sciences and Engineering (ATSE) welcomes the policy document *Out-of-field teaching of secondary school mathematics in Australia*, released today by a consortium of mathematics groups, as well as its accompanying analysis of out-of-field upskilling initiatives.

ATSE believes that addressing out-of-field teaching is imperative to improving mathematics education and addressing our future science workforce needs. ATSE explored this issue and possible solutions in its 2022 report [Our STEM Skilled Future](#).

The analysis released today demonstrates that current upskilling programs lack national coordination and do not address the magnitude of out-of-field teaching, while highlighting successful international examples that could be adapted for the Australian context.

ATSE endorses these findings and the group's call for a joint Commonwealth-State upskilling program, together with coordinated, comprehensive data collection on teacher specialisations.

The *Out-of-field teaching* document was developed jointly by the Australian Mathematical Sciences Institute (AMSI), the Australian Mathematical Society (AustMS), the Statistical Society of Australia (SSA), the Mathematics Education Research Group of Australasia (MERGA) and the Actuaries Institute.

ENDS

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Australian Bureau of Statistics

Locked Bag 10 | Belconnen ACT 2616

Ref: EC24-000144

Professor Ian Gordon  
President  
Statistical Society of Australia

[irg@unimelb.edu.au](mailto:irg@unimelb.edu.au)

Dear Professor Gordon

I write to express the ABS' support for the Position Paper on Relieving Out-of-Field Teaching in Australian Secondary Mathematics.

As Australia's National Statistical Office, the ABS maintains a skilled mathematical and statistical workforce which benefits from the effective teaching of mathematics and statistics in Australian schools. It is unfortunate that the teaching of mathematics and statistics requires such a substantial number of out-of-field educators.

The ABS is supportive of initiatives that seek to build the capability of Australian educators to teach mathematics and statistics and, by extension, that raise the level of education in these areas. The education of students in mathematics, data and statistics is of growing importance in our data-rich world. It is important that teachers are well equipped to respond to this growing need.

The ABS supports the intent of the Position Paper to raise the capability of Australian mathematics and statistics educators by relieving out-of-field teaching of mathematics and statistics and recognises its recommendations as important steps towards this objective.

Yours sincerely

A handwritten signature in black ink that reads "David Gruen".

Dr David Gruen AO  
Australian Statistician

15 April 2024



**Support for the Position Paper:  
Relieving Out-of-Field Teaching in Australian Mathematics**

Wednesday the 6<sup>th</sup> of March, 2024

Dear Professor Prince,

Thank you for the opportunity for the Australian Council of Deans of Science ([ACDS](#)) to review the following three documents:

- Relieving Out-of-Field Teaching in Australian Mathematics: Position Paper
- Relieving Out-of-Field Teaching in Australian Mathematics: Teacher Shortages: The Elephant in the Room
- Relieving Out-of-Field Teaching in Australian Mathematics: Analysis of out-of-field secondary mathematics teaching upskilling initiatives in Australia

developed by 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.

As you know, the ACDS is the peak organisation representing University Science in Australia. We represent the leadership of Australia's University Science Faculties, Colleges, and Schools, which are responsible for the strategic development and delivery of science teaching and research in our universities. The ACDS provides advocacy, advice and support for members and acts as a voice for Australian university science. Our mission is to advocate for the advancement of University Science Education, Research, and Policy.

In reviewing the above documents, I consulted with the Executive Committee of the ACDS, which comprises several current Deans of Science (or equivalent), past Deans of Science and Senior executive staff. Members were **unanimously in support of the arguments presented in the position paper and the specific recommendations:**

- **Recommendation 1:** Institute a Commonwealth-State/Territory upskilling program at scale for out-of-field teachers of mathematics.
- **Recommendation 2:** Concurrently create a national system for accurate and consistent data collection of every teacher's content specialisations.

We were also pleased to see a strategy for addressing an issue that the ACDS has been concerned about for some time and agrees is a significant contributor to the decline in engagement with secondary school and University level mathematics.

In our deliberations, we acknowledged the complex issues that need to be addressed to ensure that Australia's future workforce is numerically literate and has the quantitative skills to drive the innovation economy required for a prosperous future and commended the program's incorporation of both professional development and systematic data collection on teacher specialisations.

Our only concern relates to the focus of the documents solely on Mathematics, noting that the presence and impact of OOF are also relevant to other disciplines and subject areas. Indeed, we argue that acknowledging this issue in a broader context could strengthen the proposal further and ultimately enhance the impact of the recommended initiatives.

Thank you for your leadership on this crucial issue. The ACDS strongly endorses this initiative and is confident in our collective ability to advocate for policies and programs that address the issues raised in the position paper.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Melissa Brown', with a stylized flourish at the end.

Professor Melissa Brown  
President, Australian Council of Deans of Science



21/03/2024

**Re: Position paper - Relieving Out-Of-Field Teaching in Australian Secondary Mathematics**

I write to express the strong endorsement of the Australian Institute of Physics for the position paper "*Relieving Out-Of-Field Teaching in Australian Secondary Mathematics*", dated March 2024, prepared by 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.

Mathematics is of foundational importance to all areas of STEM, and hence vital to Australia's economic and social future. We need widespread mathematical literacy to underpin Australia's competitiveness in the global knowledge and innovation economy.

The Australian Institute of Physics (AIP) is the national professional body for physics. Our members have noted, with increasing concern, many of the issues highlighted in the position paper. Mathematics is the language of physics, and a critical component of any physics training. The AIP's accreditation of university physics programs requires students to undertake a substantial program of tertiary level mathematics. Reduced quality and availability of high-school mathematics training directly impacts the pipeline of students into the physical sciences.

The shortage of high-school mathematics teachers in Australia has reached crisis point. The teaching of mathematics classes by out-of-field teachers is prevalent in Years 7-10, the crucial period when students start to consider subject choices and career paths. Moreover, the lack of suitably trained teachers is particularly severe in socio-economically disadvantaged areas, entrenching disadvantage and lack of opportunity. As a result, strategies to support and up-skill out-of-field teachers are desperately needed.

The approach outlined in the position paper is a pragmatic and much needed short-term solution. The Australian Institute of Physics fully endorses this approach.

Yours sincerely,



Professor Nicole Bell  
President, Australian Institute of Physics  
[president@aip.org.au](mailto:president@aip.org.au)

4/3/2024

To Whom It May Concern:

The Computing Research and Education Association of Australasia (CORE) endorses and supports the position paper "*Relieving Out-Of-Field Teaching in Australian Secondary Mathematics*", dated March 2024. The report has been produced by a consortium involving the Actuaries Institute, the Australian Mathematical Sciences Institute (AMSI), the Australian Mathematical Society, the Mathematics Education Research Group of Australasia and the Statistical Society of Australia. This timely report highlights both the critical role of mathematics for Australia's future prosperity and proposes a pragmatic approach to resolving the problem in the short term.

For background, CORE is an association of university departments of computer science in Australia and New Zealand. The purposes for which the Association is established are:

- to facilitate professional development for those engaged in computer science and information technology in higher education and research institutes;
- to assist and advance research in computer science and information technology in higher education and research institutes;
- to assist and advance teaching in computer science and information technology in higher education;
- to provide a forum for those interested in computer science and information technology so as to stimulate discussion of relevant issues; and
- to promote co-operation and liaison with other groups and organizations which have related or complementary purposes and activities.

CORE is an associate member of AMSI and notes the significant alignment with many of the organisations in the consortium. Many of our members have highlighted problems like those noted in the report in the teaching of high school computer science, namely that IT or Computer Science teachers often lack the expertise to cover the material well. This is a problem for both them and their students, and seriously detracts from the overall experience.

The approach outlined by the consortium is a practical solution in the short term and is fully endorsed and supported by CORE. Their proposal for a joint Commonwealth-State upskilling program is national in reach and transcends state boundaries. It also presumably spans both the private and public sector, bringing expertise to a diverse range of communities and socio-economic profiles. The proposal to perform a coordinated, comprehensive data collection on teacher specialisations seems essential to start this process, and we also support this.

Furthermore, CORE would be pleased to work with consortium members on areas of mathematics that relate closely to our own expertise, in particular the teaching of logic, computational thinking, computer programming and data science. These topics alone form a good overlap with the current mathematics curriculum, and it would be economic to perform them with a single effort.

Yours sincerely



**David Abramson, Ph. D, D. Sc.**

Professor of Computer Science

President of CORE

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ENGINEERS  
AUSTRALIA

## **Relieving out of field teaching in Australian secondary mathematics: Position Paper**

Engineers Australia is acutely aware of the challenges facing the engineering profession in Australia, and deficits in education is a significant factor.

The profession continues to face skills gaps stemming from a lack of domestically trained engineers entering the profession. While there are many facets to this problem, declining standards of maths education, specialist teachers and student uptake are directly hindering our domestic skills development.

The number of students studying intermediate and advanced level maths is at an all-time low, while the number of students studying general mathematics has also declined. Contributing to this is an overstretched teaching workforce for maths which needs more support. Further compounding the issue is the nation producing fewer mathematically educated teachers meaning more students are being taught by out-of-field teachers. This is detrimental to both teachers and students.

Engineering is the practical application of maths, science and the engineering method to solve problems. Mathematics is fundamental in answering some of the most complex challenges facing our society - without students studying maths, we won't have engineers.

Engineers Australia endorses this paper which looks at practical ways to relieve out-of-field teaching in Australian secondary mathematics. We call on the government to recognise the urgency and scale of this problem. We need all levels of government, to work together us, with industry, educators and business to find solutions to urgently boost Australia's teaching capability to increase the number of maths teachers with relevant qualifications. Our skilled workforce is dependent on it.

Damian Ogden ComplEAust  
Group Executive, Policy and Public Affairs  
Engineers Australia

March 2024



To Whom It Concerns

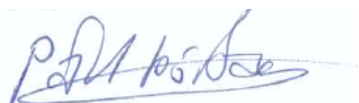
The Royal Australian Chemical Institute wholeheartedly endorses and supports the position paper “*Relieving Out-Of-Field Teaching in Australian Secondary Mathematics*”, dated March 2024. The report has been produced by a consortium involving the Actuaries Institute, the Australian Mathematical Sciences Institute (AMSI), the Australian Mathematical Society, the Mathematics Education Research Group of Australasia and the Statistical Society of Australia. This timely report highlights both the critical role of mathematics for Australia’s future prosperity and proposes a pragmatic approach to resolving the problem in the short term.

The RACI is a 107-year-old organisation representing over 3500 chemistry professionals. The RACI is engaged on various fronts in support of the fundamental role of chemistry and has been actively involved in various national reviews such as that of the ARC, and most recently it has very actively engaged in discussions with Dr. Cathy Foley, Australia’s Chief Scientist on the review of Australia’s science and research priorities. These discussions point to the importance of chemistry in the development of Australia’s future industries, and most pressingly the future of our existing industries, supporting healthy and thriving communities and ensuring a net zero future. To this end, high quality, equitable access to STEM education is critical.

Our members have frequently noted problems like those raised in the report when it comes to chemistry teaching in high schools, namely lack of adequate expertise and support for chemistry teachers. It has been said that Chemistry is about making, measuring, and modelling and hence high-quality equitable education in mathematics is also of great importance to our members.

The approach outlined by the consortium is a practical solution in the short term and fully endorsed by the RACI. It could also serve as a template for improving the quality and equitable access to chemistry education in our high schools across the country. The RACI would be delighted to work with the consortium members on areas of mathematics that are of particular importance in chemistry, including statistics, algebra, and data science.

Yours sincerely



Prof. Pall Thordarson

President Royal Australian Chemical Institute (RACI) 2022-2024

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12 March 2024

To whom it may concern,

Science & Technology Australia is the peak body for Australia's science, technology, engineering and mathematics sector. STA has 140 member organisations, and collectively represents more than 220,000 STEM professionals across the country.

As Australia navigates a future in an increasingly complex world, driven by technological advances, it is critical that we have a mathematically literate workforce to support the nation and our future prosperity. The jobs of the future will be increasingly STEM-oriented, and maths is a critical underpinning capability across all STEM disciplines. We must ensure our children are taught maths by qualified teachers with the appropriate expertise – in both maths itself, and also in the most effective ways to teach it.

There is no one simple fix to address the complex problem of overall and specialty-specific teacher shortages across the country. However, we must work to ensure our maths teachers are fully equipped to teach – and inspire – Australian students, from their earliest days in school through to senior high school, when they will make pivotal choices to determine their careers.

The current situation in which an estimated 40% of teachers teaching maths are 'out-of-field' – i.e. they do not have maths expertise or training in the best ways to teach maths – is untenable. It is not fair to teachers, nor students. That this issue disproportionately affects students in disadvantaged areas is also a serious concern. There is an urgent need to ensure Australian students are getting the best maths education possible, from confident and capable teachers.

Science & Technology Australia supports the work done by the consortium of the Australian Mathematical Sciences Institute, the Australian Mathematical Society, the Mathematics Education Research Group of Australasia, the Statistical Society of Australia and the Actuaries Institute.

The consortium's recommendations that all jurisdictions should record teachers' specialisations is a sensible move that would help inform future work to address this issue. Delivering a nationally coordinated and consistent program to help upskill out-of-field maths teachers – a program that has proven to be effective overseas – would be a potential game-changer in securing our maths teaching workforce and the maths capability of all students and Australia's future workforce.



**Professor Sharath Sriram**  
President  
Science & Technology Australia



**Dr Sandra Gardam**  
A/g Chief Executive Officer  
Science & Technology Australia