

Maths subjects have low priority in Australian schools Risk of poor marks may deter students: Actuaries Institute

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- Only about 30% of Year 12 students study intermediate or high-level maths.
- Just 7% of girls and 12% of boys study advanced maths.
- Low participation rates may perpetuate systemic inequalities that require public policy response.

Only around 30% of Australian students in their final year at high school are studying intermediate or higher maths, and as many as a quarter of all Australian Year 12 students are not studying any maths at all, leading actuaries said in a research note.

Low levels of participation, and the fact maths subjects are not a priority in Australian schools, mean “the adverse implications for individuals, our profession and society in general, are serious,” said the authors, David Barnes, Martin Mulcare and Margarita Psaras.

“Actuaries solve the practical problems of managing risks using high level maths, statistics, economic and financial analyses,” said Actuaries Institute Chief Executive, Elayne Grace, adding the profession relies on experts who have a deep understanding of maths. The note, [Where Have All the Higher Maths Students Gone](#), looks at the contributing factors to lower participation rates in maths at school and calls for public policy change.

“It is disappointing that as many as 25% of Year 12 students in NSW are not studying any mathematics,” it states. “Of great concern is the disparity between males and females: only approximately 7% of Australian female students in Year 12 study higher maths subjects, compared with around 12% for males.”

Maths subjects are not compulsory in Year 12 in NSW, the ACT and Victoria, which means a greater number of students in Australia’s most populated states are graduating without maths in their final years at school. This compares poorly with most OECD countries.

The research note builds on earlier work from the Australian Mathematical Sciences Institute, Stanford’s Professor Keith Devlin, and Flinders University’s National Institute of Labour Studies.

The note also said a shortage of STEM-qualified teachers contributes to declining enrolments in those subjects. Nationally, about 45% of respondents (principals) said maths and science classes conducted in their schools were taught by teachers not fully qualified.

And, quoting Dr Sue Thomson, from the Australian Council for Educational Research (ACER), it states students choose subjects they like and may be successful in. Dr Thomson says that in order to learn maths, students need to make mistakes. Fluency in maths comes with repetition.

She said senior students can also be focused on excelling in standardised testing and achieving a high ATAR. And the way maths is assessed and graded, compared with English or History subjects, could potentially affect a student’s decision to take or drop maths subjects in the final years of school.

“Mastering mathematics requires students to memorise formulas and processes, including complex and sequential equations, and understand maths strategies to build a solid foundation.



“In order to learn, mathematics requires making lots of mistakes. Students must repeat the same types of questions until they master maths fluency, which can be a frustrating process.” Repeatedly getting the answer wrong may discourage some students.

It states that students sometimes regard maths as abstract and irrelevant, with complex concepts. And where students are anxious about maths, that anxiety may prevent them from learning further.

The actuaries said that navigating life requires a foundation of mathematical understanding. Consumers need basic maths to assess value, understand interest rate calculations for loans and returns on investments. “Higher stakes examples arise when large amounts of money are involved, like home mortgages, superannuation, investments and insurance coverage.”

Employees with maths skills are also highly valued and generously compensated. A study from Flinders University found STEM-qualified managers earn 10% more, and for those in roles classified as “non-STEM”, the pay premium can be as high as 13%. STEM skills will increasingly be in demand as data analytics, technology, the digital economy, and financial markets expand.

It warns: “The consequences of declining higher maths participation in school will be far-reaching.

“Participation in higher maths study is lower for girls than boys and performance in mathematics is lower in low socioeconomic (SES) communities than high SES communities. Hence, school level mathematics study may perpetuate systemic inequalities that policymakers are addressing in other areas.”

The Actuaries Institute will develop a policy position statement with Institute members and call on state and federal governments to review public policy to affect change.

Martin Mulcare is available for interview.

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As the sole professional body for Members in Australia and overseas, the Actuaries Institute represents the interests of the profession to government, business and the community. Actuaries assess risks through long-term analyses, modelling and scenario planning across a wide range of business problems. This unrivalled expertise enables the profession to comment on a range of business-related issues including enterprise risk management and prudential regulation, retirement income policy, finance and investment, general insurance, life insurance and health financing.