

Push for Year 12 maths prerequisites for STEM degrees

March 17, 2016

☆ Read later



Kate Aubusson

Journalist

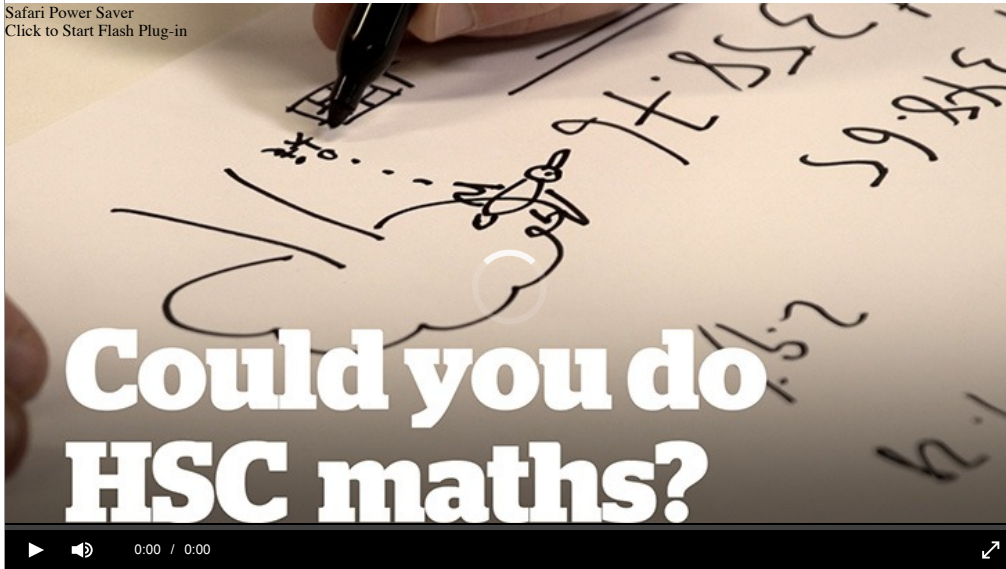
[View more articles from Kate Aubusson](#)

[Follow Kate on Twitter](#) [Email Kate](#)

submit

[Email article](#) [Print](#) [Reprints & permissions](#)

Safari Power Saver
Click to Start Flash Plug-in



HSC maths: could you do it?
We test a few grown-ups with a couple of questions from the 2015 HSC General Mathematics paper. Some found it a little more challenging than others.

All year 12 students should be made to study intermediate mathematics if they want to enrol in a science, engineering or commerce degree at university, according to a national report by the Australian Academy of Science (AAS).

The [ten-year plan](#), to be launched by the [federal education minister](#) on Thursday, recommends mid-level maths - which includes a calculus component - be introduced as a prerequisite for STEM courses across all Australian university.

Only 14 per cent of university science degrees currently require students to have studied intermediate maths - the equivalent of the 2 unit advanced HSC course - in Year 12, according to the report compiled by the AAS National Committee of Mathematical Sciences.



Students need to do the 2 unit maths course to cope with university STEM courses Photo: Nic Walker

"This is an absolutely critical issue. We've hit a pretty low point," said the director of the Australian Mathematical Sciences Institute Professor Geoff Prince, who helped develop the report.

"It sends a very clear message to schools, students, parents and teachers that maths is not valued, which has put a downward pressure on [maths] enrolments, not just in Year 12 but throughout secondary school," he said.

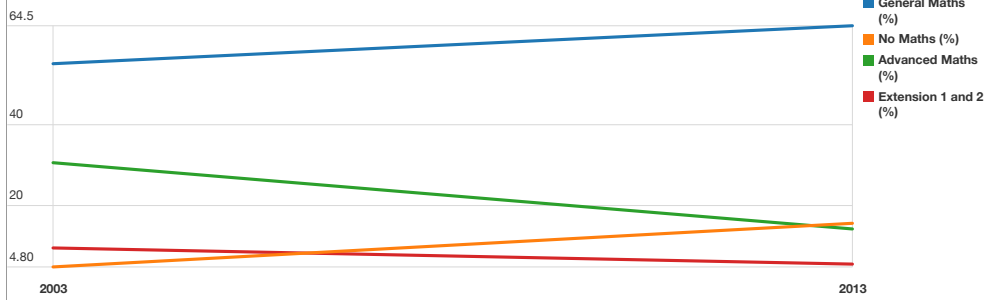
Currently no NSW university enforces a maths prerequisite for STEM degrees, despite data suggesting students who are not given appropriately maths preparation fare significantly worse than those who perform well in intermediate maths in Year 12.

A study of almost 50,000 maths students in the 2013 HSC, published in the Australian Journal of Education, revealed a scaling advantage for those who took the general mathematics course.

But the shift by universities to list assumed knowledge rather than strict prerequisites for degree courses had caused fewer high school students to take harder maths courses and resulted in higher drop-out rates, found research by the Australian Mathematical Sciences Institute.

Decline in High School Mathematics

HSC maths 2003-2013



Source: [University of Sydney Get the data](#)

Created with [Datawrapper](#)

The move was partially driven by a decline in STEM course enrolments across many universities, a trend that began in the early 1990s, according to the institute.

The prevent a repeat in this drop in students deciding to opt for a STEM degree, prerequisites would need to be phased in slowly, Professor Prince said.

"If it happened tomorrow it would cause a real shock to the education system because many schools don't have the resources to be able to teach these [intermediate maths] subjects.

"We need to give schools the time to adapt, and they may need some support to do so," Professor Prince said.

Among its 12 recommendations, the report also pushes for increasing professional development for out-of-field maths teachers.

"Our best shot at fixing the problem is improving teaching and introducing pre-requisites," Professor Prince said.

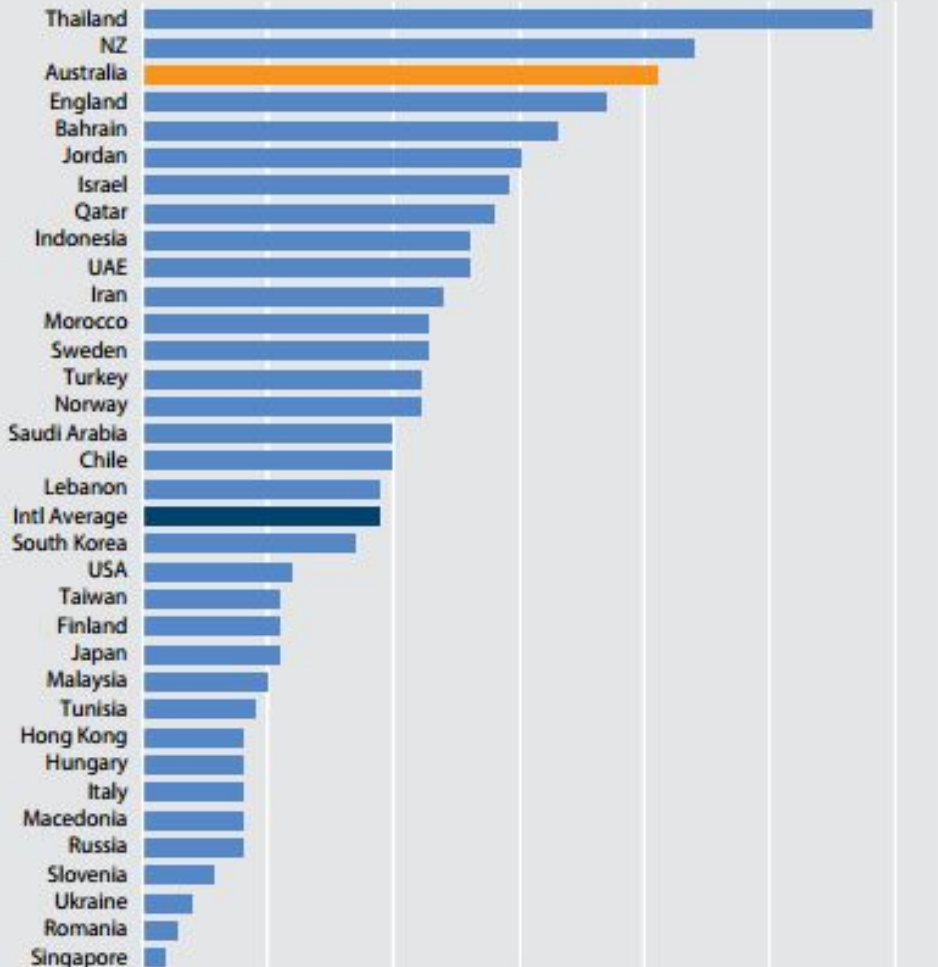
In February the University of Sydney led the charge against declining standards and enrolments by requiring students across STEM courses to have passed intermediate level maths, at minimum from 2019.

"The data we have is pretty emphatic: there is a very measurable difference in academic success ... between students who have two-unit Mathematics [in Year 12] and those who don't," said University of Sydney deputy vice-chancellor Tyrone Carlin.

Education minister Simon Birmingham, who is due to present the report at Parliament House, said it "laid clear path" for this generation of students and into the future.

"Around 75 per cent of Australia's fastest growing industries require science, technology, engineering and maths skills which is why we have committed \$112 million for programs to encourage more students to get engaged in those areas," Senator Birmingham said.

Difficulties filling vacancies for mathematics teachers



0 10 20 30 40 50 60

% of year 8 students in schools where principals report difficulty filling maths teacher vacancies

In 2015 the University Admissions Centre director of information services Kim Painoh told the Herald last year reform would require co-operation between the Board of Studies, the UAC and universities on developing a new scaling system.

She urged students to "look at the big picture, take heed of the assumed knowledge listed by universities and think about what skills you need to prepare for life after ATAR".

The plan, developed by the National Committee for Mathematical Sciences, makes a dozen key recommendations including increasing professional development for out-of-field maths teachers and a new national mathematics research centre to link industry and research. It also highlights an urgent need to address the low participation of women and rural Australians in the mathematical sciences.

Recommended



Argentina sinks Chinese ship after high-seas chase

World



Vivid Sydney Announces Epic 2016 Line Up With Bon Iver...

The Huffington Post Australia



When the super-rich divorce, the gloves come off

Life & Style



Auction watch: Strong results across Canberra on a...

Domain



Makeover brings 1980s Gowrie classic back into fashion

Domain

Promoted Stories



Why camp when you can glamp?

Kmart



12 Most Dangerous Cities in The World to Travel

DailyForest



Worst Exercise For Women Over 40

MAX Workouts



The smartphone for tradies is here

Smarter Business Ideas by Telstra



Public versus Private Health Care in Australia

~...
Budget Direct

Recommended by **Outbrain**

submit

Email article Print Reprints & permissions