

High school study in maths declining among prospective teachers

February 16 2015, by Rachel Wilson

Maths and science participation among New South Wales HSC students has declined starkly over the past decade, which in turn is leading to fewer teachers with this crucial background for their work in schools, according to new research.

University of Sydney researchers studied the maths and <u>science</u> combination choices made by students in the New South Wales HSC between 2001 and 2013 and published their findings in the *International Journal of Innovation in Science and Mathematics Education*.

Between 2001 and 2013 the proportion going on to study HSC without any maths tripled. This tripling was also the case in those receiving Initial Teacher Education (ITE) university offers during this time, with growing numbers studying no maths (4.8 to 15.6 percent), an increasing majority in general maths (55.1 to 64.5 per cent), and a halving of 2 unit (30.6 to 14.2 percent) and extension courses (9.5 to 5.46 percent).

"Not only are we seeing declines in math and science participation among <u>high school students</u> in general; we are seeing a steeper decline among those students going on to study to be teachers," said Dr Rachel Wilson, who co-authored the report with Honorary Associate Professor John Mack.

"This is particularly concerning because it sets up a vicious cycle in which there is less and less engagement with maths in schools."



Australia sits apart from most of the developed world in that post-16 mathematics and science education is elective. Despite the introduction of the national curriculum, which includes maths curriculum for the final two years of high school (Years 11 and 12, ages 16-18 years), there is currently no mandating of maths or science study for these years.

"In most developed nations maths is a mandatory requirement for high school graduation. If we are to halt the decline in maths education in Australia it would be logical to start by introducing higher school certificate maths as a requirement for all those students intending going on to a teaching career," said Dr Wilson.

The researchers write that the current system of choice in HSC study has unwittingly produced a system, which is dynamic and subject to a wide range of influences. These include high-stakes pressures, pragmatic choices regarding workload, parental pressures, variations in school provision, and a lack of university prerequisites. However, maths is seen as an important foundation for all study in STEM - Science, Technology, Engineering and Maths.

"STEM is considered critical to all new economies. Yet, unlike many countries which show improving standards on international assessments of <u>maths</u> and science, Australian 15 year olds' scores have been declining since 2000," said Dr Wilson.

"The role of teachers is key to building strength in Australian STEM education. While the NSW government has proposed numeracy assessment of final year teacher education students and prospective teachers are expected to be in the top 20 percent of the population in numeracy (and literacy), this approach will be pushing against the tide if those <u>students</u> have not basic math and numeracy skills from <u>high school</u> ."



Provided by University of Sydney

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