AMSI News

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2014 Discipline Profile and Policy Brief released

This year's AMSI Discipline Profile of the Mathematical Sciences got off to a flying start with two very good pieces in the *Australian Financial Review* by Joanna Mather around gender and out-of-field teaching. So good in fact that I did four radio interviews on 10 June after stepping off a plane from Brussels.

The headline trends in the Profile are as follows.

- Regional and socio-economic inequality in the mathematical performance of school students is worsening.
- Australia's international position in school mathematics performance has declined sharply.
- Year 12 advanced maths enrolments have dropped by 22% from 2000 to 2012 and by 34% from 1995 to 2012.
- 40% of Year 7–10 maths classes are without a qualified mathematics teacher, roughly three times the international average and roughly twice the estimated rate for Year 7–10 science classes.
- 54% of Australian adults have only basic numeracy skills at best, below the OECD average.
- Undergraduate and postgraduate enrolments in mathematics and statistics have been stagnant for the last three years.
- Females make up only 30% of undergraduate and postgraduate enrolments in mathematics.
- International students make up around 35% of all PhD enrolments in the mathematical sciences, with domestic enrolments in decline.
- Australia's graduates PhDs in the mathematical sciences at one of the lowest rates in the OECD and at half the OECD average.
- The mathematical sciences are one of Australia's most successful research disciplines with an international performance comparable to medical research.
- The mathematical sciences has a higher sustained success rate for research grants from the Australian Research Council than any other discipline.

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AMSI's policy brief 'Dealing with Australia's Mathematical Deficit' identifies three key priorities for urgent and sustained action by the various stakeholders, as follows.

Priority A

Train the unqualified teachers of school mathematics and secure the supply of future maths teachers.

Priority B

Reverse the decline in intermediate and advanced maths enrolments at Year 12.

Priority C

Increase the number of girls studying maths and women employed in the quantitative professions.

There should be no doubt about the serious and structural nature of these problems. About 10 years ago, the Deans of Engineering were brought face to face with the decline in Year 12 advanced maths enrolments and made the mistake of dropping prerequisites. Will our university maths and stats departments make a similar mistake and just be reactive? The Group of Eight may now have enough students with advanced and intermediate maths to maintain their third year numbers and they may not have felt the decline in the school situation, but surely we know a straight line when we see one! We all of us have to recognise that we can't be insulated from the appalling situation in so many secondary schools and that female adult numeracy runs so far behind that of males. As I've said so many times 'mathematical illiteracy is disabling'.

At the moment governments and the press are listening, so please join the chorus of voices speaking out about the nation's mathematical deficit.

The documents are at http://www.amsi.org.au/index.php/news/87-news/general-and-outreach-news/1290-discipline-profile-of-the-mathematical-sciences-2014.

I was a Monash undergraduate and took out a La Trobe PhD in 1981 in geometric mechanics and Lie groups. This was followed by a postdoc at the Institute for Advanced Study in Dublin. I've enjoyed teaching at RMIT, UNE and La Trobe. My research interests lie mainly in differential equations, differential geometry and the calculus of variations. I'm a proud Fellow of the Society, currently a Council and Steering Committee Member. I became AMSI director in September 2009.