

# Access to Mathematics Is Vital for Equity

BY JAN THOMAS

**The disastrous state of mathematics education in Australia is more than a brake on the nation's capability in research and innovation. It also reflects a lack of social justice for students.**

The elephant in the room for science, innovation and social inclusion in Australia is access to a robust education in mathematics. By this I mean a mathematics education that takes account of students' backgrounds and aspirations. It means well-qualified teachers of mathematics and a clearly articulated curriculum of international standard.

In the mid-1980s a respected Scandinavian mathematics educator, Stieg Mellin-Olsen, argued that mathematics was nearly as important to a student's life chances as being literate. Mellin-Olsen died on Australia Day 1995, a year that was a watershed for Australian mathematical sciences. It heralded a steady decline of mathematical sciences in Australian universities that now underpins a situation in schools that is the antipathy of what Mellin-Olsen believed.

A review of Australian mathematical sciences in 1995, published early in 1996, identified challenges but was generally optimistic about the future. However, when the Howard government reduced funding to universities from its first Budget later that year, it had a profound impact on university mathematics and statistics departments. Reasons for this included a faulty funding model for the teaching of mathematics and statistics, and falling numbers of Year 12 students completing intermediate or advanced mathematics courses.

The subsequent flight of many of

Australia's best mathematical minds to other nations and the steady contraction of mathematics and statistics departments are well-documented. The percentage of Australian graduates with a major in mathematics or statistics has slumped to less than half the OECD average.

Unsurprisingly, this has led to a disastrous situation in regard to the supply of mathematics teachers in secondary schools. The lack of sound mathematical knowledge of many primary teachers is also a significant factor.

While other English-speaking countries with similar mathematics curricula have begun to improve in international tests, Australia has gone backwards. In the Trends in Mathematics and Science Study ([www.acer.edu.au/timss/](http://www.acer.edu.au/timss/)), Australia was statistically above the USA and England in the mid-1990s. In the most recent study (2007) we were statistically below both.

In the past two decades Australia has gone from having mathematics education in schools that had some problems but gave most students at least a chance, to one where access to a decent mathematics education is largely determined by where you live and parental income. It is no longer an issue of access and equity in remote rural areas or disadvantaged schools but an endemic problem that gets worse every year.

The ultimate solution lies in rebuilding mathematics and statistics in our universities so that the supply of graduates



Photo: Michael Shaw, AMSI

increases. There was a brief glimmer of hope in 2006 when funding for the teaching of mathematics and statistics was increased by nearly \$3000 per equivalent full-time student. However, very little of this extra money found its way to mathematics and statistics departments.

The subsequent federal government has now endorsed the Bradley review's recommendation for ambitious national targets of 40% of 25–34-year-olds attaining a Bachelor level or above by 2025 and a 20% share of undergraduate enrolments from low socio-economic status by 2020. Unless mathematics in the universities and schools is greatly enhanced these targets will only be met by creating courses that do not prepare students for jobs in the modern world where mathematical skills are virtually mandatory.

Students equipped with adequate mathematical skills are already in a privileged position in gaining access to rewards in a world of science and technology. In Australia, the unforeseen consequence of the decline of mathematical sciences is a filter for "social inclusion/exclusion".

In other parts of the world mathematics education is discussed around values like "opportunity for citizenship and the global economy", "civil rights", "equity" and "social justice". We urgently need debates in these terms in Australia.

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