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Mathematics students in serious decline

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THE state of maths and science at Australian schools and universities has deteriorated to a "dangerous level", the nation's top mathematicians have warned.

The number of students enrolled in a maths major at Australian universities declined by 15 per cent between 2001 and 2007, according to a hard-hitting review of maths and science education commissioned by the vice-chancellors of the nation's eight research-intensive universities.

The review also found the number of students taking advanced maths at secondary school fell by 27 per cent between 1995 and 2007.

The review, conducted by a reference committee of the nation's leading mathematicians chaired by former University of Sydney vice-chancellor Gavin Brown, concluded that Australia had "gone backwards over the last 20 years in terms of the quality and quantity of students completing Year 12 mathematics".

It is a trend not lost on physics professor David Blair, director of the University of Western Australia-based Australian International Gravitational Research Centre.

He told The Australian that what had become apparent was the outstanding quality of international students compared with local students.

"Particularly students from China have got a vastly greater depth of mathematical understanding, and I have to say that must be a reflection of the declining standards here," Professor Blair said.

Five of his students involved in a study to directly detect vibrations of space, called gravitational waves, are about to be awarded their PhDs.

One, Andrew Sunderland, said mathematics and science had not been popular high school subjects because students thought they would not lead to jobs.

"When I did physics in high school, they changed the course a few years ago so that you did less maths as part of the physics course and you learned about the history of physics instead," he said.

Another, Eric Howell, had noticed the same pattern. "They've watered down maths in high schools. It's always been a small percentage that's been into that and they've overcompensated."

A member of the review committee, Nalini Joshi, associate head of the University of Sydney's school of mathematics and statistics and president of the Australian Mathematical Society, described the decline in the number of qualified maths teachers as a "looming disaster" for Australia.

"This problem is part of a vicious cycle," she said. "The decline in numbers of qualified teachers means a decline in the number of students who are inspired to take advanced mathematics courses at high school.

"In turn, this means there are fewer people entering university who are able to take quantitative and scientific courses that require a mathematical background. This leads to fewer graduates who are interested in teaching mathematics or qualified to do so. So the decline in teacher numbers deepens with each year that passes."

The review said universities would be forced to respond to the dumbing down by introducing costly remedial programs. It found that many teacher trainees had dropped maths in school to maximise their tertiary entry rank, and among them "mathematics phobia" was widespread.

It also said 40 per cent of senior mathematics teachers did not have three years of university study in the subject.

"The quality of teachers is clearly of crucial importance," the review said. "It appears that, despite a number of initiatives, there are not enough appropriately qualified maths teachers."

Universities were suffering from the decline of suitable students coming down the supply chain from schools, the review found. Serious decline had been seen in both the number of mathematics majors and the number of staff in mathematics departments, the review found.

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