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The Sydney Morning Herald

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Maths, the passport to full employment

November 5, 2007

Real life problems may not be simple to solve. But for Greg Longdish, a second-year PhD maths student at the University of NSW, mathematics is the tool needed to find the solutions. And it is a tool many Australians undervalue, says Longdish, who has been working on developing mathematical models of HIV epidemics that would help estimate the effect of various theoretical scenarios.

"Mathematics is logical deduction and a lot of things in this world work on that cause and effect relationship. But people think maths is something strange that you do with numbers, perhaps helpful with a cash register," he says.

Change may be afoot, however. In May, the Federal Government announced its plan to allocate extra funding for some key disciplines in universities, following the review of the Higher Education Support Act 2003. The 2007-08 federal budget promised the discipline of mathematics and statistics a big lift of $2729 in per-student funding.

But mathematicians are still worried. Professor Peter Hall from the Australian National University says Australia has long been incapable of producing the trained mathematical modellers it needs in pharmaceutical companies, banks and government agencies such as CSIRO and the Australian Antarctic Division.

"We have a long way to go to rebuild the mathematical sciences in Australia, and the extra funding is only a start," he says.

The National Strategic Review of Mathematical Sciences Research in Australia published last December showed that university mathematics faculties in have lost more than 30 per cent of their staff in the past 10 years. Only 0.4 per cent of Australian university students were graduating with qualifications in mathematics or statistics, below the Organisation for Economic Co-operation and Development average of 1 per cent.

Amidst this persistent shortage, however, the prospects for mathematicians remain bright. Peter Taylor, executive director of the Australian Mathematics Trust, says graduates with mathematics majors are fully employed and at the top of the pay scales.

So why, then, are people still recoiling from maths?

James Franklin, associate professor in mathematics at the University of NSW, thinks there is a mistake being made on both sides, the public and industry. He says there is a lack of mathematicians because people are not aware of the job opportunities that studying mathematics can provide and therefore choose not to go into it. And the problem is compounded because industry often does not know that mathematicians can be employed to improve production. Even if they do, there are few around with the qualifications.

While public misconceptions often divert students who are interested in maths into studying other popular areas such

as commerce and medicine, Ben Waterhouse says being equipped with mathematical skills can be a priceless asset in finding a job. Waterhouse is working on a collaborative research project with the Macquarie Bank on developing faster methods to value complex financial products,

"If you understand problems that you see in the maths degree, you can get a job in any industry that doesn't seem mathematical at all - because you've trained your brain to think about problems in a certain way to get a logical answer out of it," he says.

For mathematicians, it is obvious how and why maths can benefit the society. But explaining it to the public is not easy.

The media, for some, became another avenue to popularise maths and science. Karl Kruszelnicki, science commentator on radio and television and now a political candidate for the Senate in the federal elections, believes more shows in those areas have made the general public more interested.

"After all, everything has areas of interest, if the story is told correctly," he says.

The astronomer Fred Watson, last year's winner of the Eureka Prize for Promoting Understanding of Science, says that by appearing on about 200 radio broadcasts a year and publishing articles and books he hopes to direct students towards studying maths and science. "I'd like to see a greater willingness from media outlets to promote it," he says.

Does Australia have what it takes to be a leading country in mathematics?

Iain Johnstone of Stanford University thinks so. As an international reviewer of the *Review of Mathematical Sciences Research in Australia*, Professor Johnstone says "Australia has a reputation for world-class and innovative mathematical research".

The support to maintain the ability and potential becomes more important in this age of information, he says, as there is a strong need to train mathematicians and statisticians to make best use of information overflow.

Amidst this global competition, Australia may be lagging behind.

Professor Ian Sloan of Sydney University argues that this gap matters.

"We do not want Australia to be just a farm and a quarry. If we are to have a good standard of living we need to be a highly educated nation with highly skilled occupations."