Maths in the media*

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The cost of failing UK maths students

How do you persuade a nation that basic maths skills are just as important as being able to read and write? You put a price tag on them. This is what the UK accounting firm KPMG has done in the report 'The long term costs of numeracy difficulties'[1], which was published in January. The firm estimated that the soaring number of people who leave school in the UK without adequate numeracy skills could cost taxpayers up to £2.4 billion every year. The report backs the launch of a £6 million campaign by the *Every Child a Chance Trust*[2] , which encourages businesses to spend money on helping school children overcome their numeracy problems.

According to the report, around 33 000 children (6% of 11-year-olds) leave UK primary schools each year with poor numeracy skills, which in turn leads to an estimated 7 million innumerate adults with mathematical skills at or below those of a nine-year-old. The resulting long-term cost to the public purse could be as high as £44 000 per individual up to the age of 37.

Behind the stark figures lie the personal hardships facing those affected by poor education. It is well known that unemployment, poor mental health, drug addiction and criminality often go hand in hand with poor literacy skills, but the report points to evidence that poor numeracy skills have just as important a role to play in the lives of those trapped at the bottom of the social scale. Thus, poor maths skills do not just impact on public spending through the costs associated to education — for example special needs support or truancy prevention — but also through the costs associated to unemployment, health and crime. It is these costs the report attempts to estimate. For example, it puts the price of innumeracy through unemployment at £1.9 billion, through crime at £165 million, and through drug use and teenage pregnancy at £98.9 million.

Mathematician is the best job in the US

Ironically, the KPMG report was published in the same week as a study by a US jobs website[3], which deems the job of mathematician to be the 'best' occu-

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**Millennium Mathematics Project, Centre for Mathematical Sciences, University of Cambridge, CB3 0WA, United Kingdom.
[1]http://www.everychildachancetrust.org/pubs/ECC_long_term_costs_numeracy_difficulties_final.pdf
[2]http://www.everychildachancetrust.org
[3]http://www.careercast.com/jobs/jobsRated

pation out of a list of 200, with other maths-based jobs like statistician, actuary, accountant, computer scientist and economist also making the top 12. The website CareerCast.com decided that mathematics comes top in terms of five criteria: work environment, income, employment outlook, physical demands and stress.

Mathematicians struggling with cutbacks in Australian universities might not agree with the results at first (particularly the supposedly mid-level income of US$94 000), but when you look more closely at some of the criteria (Does the job require crawling, stooping or heavy lifting? Does the job involve your own or others lives being at risk?) there is something to be said of mathematics and other professional positions faring better than the more gruelling work of lumberjacks, the 'worst' occupation. There has already been some discussion of the methodology used to create the list, but the coverage has resulted in maths being discussed in many media outlets as an attractive career option.

Minimal surface invades Sydney Customs House

Mathematics has taken on physical form in Customs House with the installation of 'Green Void' created by LAVA (Laboratory for Visionary Architecture).

'Green Void' (photo by Peter Murphy)

The installation is a minimal surface created from a tensioned Lycra material and defined by the specified boundary points arising from the geometry of the building. The five funnels of the sculpture reach out to connect the various levels, suspended from the top level restaurant, decending almost 20 metres to hover just above the main interior atrium of Customs House.

'The shape of the installation is not explicitly designed; it is rather the result of the most efficient connection of different boundaries in three-dimensional space,' said Chris Bosse, the Asia Pacific Director of LAVA. 'We only determined the connection points within the space and the rest is a mathematical formula, a minimal surface. The concept was achieved with a flexible material that follows the forces of gravity, tension and growth, similar to a spider web or a coral reef. We are interested in the geometries in nature that create both, efficiency and beauty.'

Minimal surfaces are not new to architecture and design, beginning with Frei Otto's soap-bubble experiments for the Munich Olympic Stadium in the 1970s.

They featured again in the Olympics last year: Bosse (while at PTW Architects in Sydney) was part of the design team for the Beijing Aquatic Stadium, or 'Watercube', which used Weaire-Phelan foam to create the structure of the building.

Sydney Customs House hosts Green Void until 10 June 2009.

Rachel is co-editor of *Plus magazine*, a free online magazine (http://plus.maths.org) that aims to open a door onto the world of mathematics for the general public. *Plus* is part of the Millennium Mathematics Project, a national initiative to promote mathematics, based at the University of Cambridge. Before she moved to the UK, Rachel received an MSc in semigroup theory from the University of Western Australia, and worked as a consultant for Data Analysis Australia. Rachel is also editor of the *Gazette*.