

## Science Enrolments may have bottomed, but it's a long way back to the top



The proportion of students studying physics for any reason, not just to become physicists, has dropped to only about 33 per cent of what it was around 20 years ago. Let me explain that conclusion. Some 7,300 equivalent full-time students were studying physics of some form or another at Australian universities in 1989. Now there are only 4,900, or 2/3rds of that original number. However the number of university students about doubled from 441,000 in 1989 to 957,000 in 2005 (albeit counted a bit differently). So whatever proportion of students was studying physics in 1989, less than one half of 2/3rds of them are now, which is 1/3rd or 33 per cent.

The proportion of students studying mathematics or chemistry for any reason is easier to comprehend. The absolute number of such students has stayed about the same, so in the face of doubling of the number of university students overall their proportion has fallen by about half.

Anyone can now access such statistics and more from a report about to be released by the Australian Council of Deans of Science (ACDS) entitled *Sustaining science: University Science in the 21<sup>st</sup> Century*. It is the third in a series commissioned from the national expert in DEST statistics, Ian Dobson, in which the decline in science enrolments since 1989 has been unearthed and then charted.

What matters here is the 'for any reason'. These are not just students looking to become physicists, chemists or mathematicians. Those proportions have fallen even further. But for a society participating in global economic transformation, whose competitiveness depends on riding huge waves of technological change, and whose survival depends on innovative responses to water crises, climate change, drug resistant infection and terrorism, you'd think that a greater not smaller proportion of its talent needed a good understanding of basic science.

It's a point brought home by the current skills crisis, which affects not just technical trades, but engineers, project managers, corporate analysts and people involved in researching, acquiring and rolling out new technologies from communications to irrigation to logistic systems. It's a point not lost on the US, which on June 26<sup>th</sup> voted \$6.6bn, a 10 per cent increase, to the budget of the National Science Foundation to support the physical sciences, and \$4.5bn, a 15 per cent increase, to the Energy Department's Office of Science, a key source of funds for physical sciences research.

The situation for Australia can be made to seem more benign by looking only at 2002 to 2005, the period covered by this latest report. Over this period enrolments in science seem to have bottomed out and even increased slightly. However, that's cold comfort to those people dealing with the current and growing skills crisis, who look at the current education system and see little that is different from the one that delivered such a dramatic decline.

Of most concern is the secondary school system, which harbours the skills crisis within the skills crisis. As other ACDS reports have shown, a disturbing proportion of secondary school teachers have only limited qualifications in science and mathematics. The bulk of those with the skills to give our children skills gained their qualifications years ago and a huge proportion are not far off retirement. No education authority has a public workforce plan that addresses this crisis. No education authority and no government (state or federal) has done anything to give the public confidence that it is on top of this problem.

Then there is the university system which, despite being increasingly privatised and hence more market responsive (in theory) is still unable, in the sciences especially, to respond to the fact that 90 per cent of its clients will not in any way follow in the footsteps of the academics who teach them. For science and technology the Government's Research Quality Framework (RQF) hasn't helped this a bit. Rather it has focussed institutions on a conservative preoccupation with research, and on an unbecoming obsession with size and competitiveness.

Universities have maintained their overall income in the face of declining government investment by recruiting overseas fee-paying students. A spokesperson from the Defence Materials Organisation (DMO), speaking at the APESMA skills summit in Parliament House recently, pointed out that citizenship and security requirements prevented these graduates from alleviating DMO's skills shortage, which is now acute because of increased initiatives in defence and homeland security. It is a point nicely underlined by the statistics in Dobson's report, that show that 49 per cent of students in IT are international fee-payers, as are 29 per cent of engineering students. To paraphrase the Report's title, will it be possible for university science in 21<sup>st</sup> century Australia be sustained, and will it be done in a way that solves our skills crisis?

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