

# Diversity of Research Is a National Treasure

Peter Hall warns that a new method of assessing research threatens Australia's capacity in vital disciplines like mathematics and statistics.

**D**iversity in research is something for Australians to treasure and preserve, especially in a nation with a small capability. It enables us to undertake multidisciplinary research that is strategically important, quickly acquire new skills and follow research frontiers. We need to protect diversity in the face of forthcoming changes to the way research is assessed.

The government's proposed Research Quality Framework (RQF) is already altering the landscape of research in our universities, even before it is released. Broadly speaking, the RQF (as it applies to universities) will assess the quality, merit and impact of academic research, and lead to redistribution of research funding.

In important ways, the RQF will resemble the UK Research Assessment Exercise (RAE), which since 1986 has substantially (and not always positively) reshaped the environment for research in universities. Here, it will result in substantial shifts of funding from one institution to another and from discipline to discipline. "There will be winners and losers," Gareth Roberts (Chair of the RQF advisory panel) told *The Australian Financial Review* on 10 September 2005.

As no one wants to be a loser, our universities are already running their own mini-RQFs and trying in other ways to determine the strengths for investing resources. In endeavouring to protect funding, universities are also battling the likelihood that the RQF will concentrate research dollars in a small number of institutions. Some analyses

suggest that the number could be as small as eight to ten.

This loss of diversity is having considerable impact in the basic sciences, which are under severe pressure in the "reformed" university sector. Nevertheless it is argued that, after contraction, the number of our research-active universities may be no less, relative to population size, than has resulted from the UK's RAE. So why is there a problem for Australia?

First, there is mounting evidence in the UK that research has suffered significantly from over-concentration. The UK National Review of Mathematics in 2003 commented negatively on the "reduction of diversity", arguing that "the UK cannot afford to have its high quality research concentrated in too few leading departments" and pointing to the expertise that has already been lost in strategically vital areas as universities focused on their greatest strengths and discarded others.

Moreover, it is doubtful that different levels of diversity can be compared based on population size. The dynamics of interaction and collaboration in research are not preserved when scaled down to a small specialist community. Further, the skills needed to maintain multidisciplinary programs are much the same in large and small countries.

Already the negative effects of unbridled competition have savaged Australia's scientific diversity, such as in my multidisciplinary field of statistics. The nation's shortage of statisticians has escalated, with the number of statistics departments in universities



Prof Peter Hall is developing classification tools for use with very small samples of very large vectors, arising in contexts ranging from genomics to the detection of covert signals. Photo: Kat Ng, ANU

falling by 80% in a decade.

In several disciplines the special circumstances in Australia, including our distance from Europe and North America, result in almost a closed cycle of employment. This has occurred despite strenuous efforts to import scientists from abroad. In these circumstances a narrow research environment can have especially ruinous effects.

Thus Australia is already losing diversity and shedding the skills we need for collaborative research in vital frontier disciplines like quantitative biology and several fields of engineering. The RQF seems certain to hasten this dangerous progression.

We must explore ways of attracting scientists back to strategically important fields. Possibilities range from requiring all Australian university science degrees to offer reasonable levels of instruction in core disciplines (at present not all universities offer mathematics in their science degrees) to ameliorating student-fee debts for Australians who take early-career research posts in critical areas.

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