



SUBMISSION TO REVIEW OF HIGHER EDUCATION

**Breadth of education from abstract knowledge to employment skills in individual students:  
Industry involvement in university curricula and internships**

I argue that individual graduates need a greater **range of skills from the very abstract to the vocational**, and that employers should be more closely involved in achieving this mix, through both internships and direct contributions.

My submission relates to Questions 3.1(4) on the alignment of supply and demand of graduates and 3.7(25) on the meaning of knowledge transfer. It broadly supports the views of the UK Higher Education at Work paper.

Individual new graduates possess an inadequate range of skills. Those with degrees in basic sciences and the humanities have sound knowledge of some deep area but, as employers are always complaining,<sup>1</sup> lack employment-related skills in spreadsheets, simple programming and communication. On the other hand, those in vocational degrees such as hospitality and accountancy have immediately applicable but shallow knowledge; they lack a sound grasp of anything hard and of how to research, which will limit their ability to reskill later and to mature as intelligent human beings. Yet **it is the combination of an ability to understand abstract concepts and to be on top of immediate software, office and communications skills that is rightly valued by employers** – and which is equally valuable to students. The “universality” of knowledge in (the better) universities is not translating into a breadth of learning in individual graduates.

Evidence of the need for breadth can be found in any number of job ads for graduate positions in financial areas (two examples at the end of this submission). They typically say “degree in a numerate discipline” – implying that the employer understands the value of sound abstract knowledge – but will add a request for, say, Excel, VBA and good communication skills. The

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<sup>1</sup> E.g. complaints of the Business Council of Australia in [‘Graduates “lacking job skills”](#)’, *The Australian* 13/3/2006; more extensively in DEST report, [Employability skills for the future](#), 2002.

current degree structure of a numerate discipline (or a degree in humanities, law etc) in an Australian university does not normally include more than passing attention to the latter skills.

Attacking this problem through a closer relationship between employers and academia would address a number of issues endemic to the Australian Higher Education system:

- It would fill **the major funding hole in higher education: the failure of employers to pay for the supply of graduates**. Business pays for all its other inputs, but expect the **graduates who form the basic intellectual capital of the knowledge economy** to be supplied free – then business complains about their quality, while at the same time there is no mechanism for business to provide input on the syllabus of universities (except in professional fields like medicine and engineering)
- Students would be motivated to better learning by seeing the point of both the abstract and the applied aspects of their studies
- It would help convince socio-economic groups sceptical about the benefits of university degrees that higher education has direct economic payoffs
- The regular business-academia contacts would facilitate more interactions leading to applicable research, such as Linkage grants and sabbaticals by industry practitioners in universities

That these benefits are not just speculative is shown by the success of the Quantitative Risk and Data Management programs in Mathematics at UNSW. These vocationally relevant topics in a discipline that is at the same time very abstract and very applicable gained the substantial financial support of sponsors in search of skills in shortage, the software company SAS and the Commonwealth Bank of Australia. Their support made possible teaching in those areas without cutting back elsewhere, and students of the courses have gone on to **internships and jobs with the sponsors**, to the benefit of all concerned.<sup>2</sup>

An ideal but probably unrealistic model for industry to pay for graduates would be to grant universities **intellectual property in their graduates**, similar to the IP they hold in the commercially useful products of university research. Employers would then pay universities a fee for using the universities' product. Since the legal system took several centuries to develop concepts of copyright and patents, this is probably not a likely development in the short or medium term, but discussion of it as a possibility might concentrate the minds of those accustomed to receiving their graduates free, and encourage them to support some alternative scheme for business to shoulder its responsibilities to higher education providers.

A scheme that is realistic, indeed partially in operation already, is a **system of industry internships**, funded largely by industry but with government, business and academic leadership and organisation. A principal merit of such an approach is that many businesses and public sector

**employers of graduates already perceive value in internships** and industry-linked scholarships. For example, in UNSW's Coop Scholarship program industrial partners provide \$13.5K per year per student for industry-linked scholarships, plus internships.<sup>3</sup> The partners recognise that supervising the interns is expensive in staff time, but that the trial nature of the internships saves a great deal in recruitment costs. The partners' commitment also gives them credibility in providing feedback to the University on its curricula.

It is at present very difficult to obtain funds for internship or industry scholarship schemes either through university sources, from approaching individual employers, or through the Federal Government's Diversity and Structural Adjustment Fund. It would therefore be desirable that a separate fund and a planning body be established to coordinate a **national internship scheme**.

The proposals along these lines in the Universities Australia paper, 'A National Internship Scheme' (May 2008)<sup>4</sup> are generally sound, but understate the need for industry to pay for the scheme, and for a large portion of the money for the scheme to be spent in employers' workplaces to cover the cost of organising and supervising the interns, especially in the initial stages.

The other side of the equation is the need to strengthen the basic sciences and humanities and to ensure that all university students have genuine access to the possibilities they offer of deep abstract knowledge. And those who create and use that knowledge need present barriers removed. Some recommendations are:

- That all degrees, and especially vocational degrees, have a "core curriculum" component in the style of the Harvard Core Curriculum,<sup>5</sup> to ensure students have a genuine breadth of learning
- That there be a concerted effort to abolish restrictive degree rules that make it hard for students to choose courses outside their Faculty – for example, the rules that make it difficult for UNSW Business students to study courses in mathematics, despite the well-known applicability of mathematics in business
- That higher education policy address the problem of postdoctoral researchers in the basic sciences having to exist on precarious "soft" money at the very time they need to develop a long-term research plan, buy a house and have children; nothing but long-term academic and research positions for early-career researchers will be adequate<sup>6</sup>

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<sup>2</sup> <http://www.maths.unsw.edu.au/news/2006/quantitativrisk.html> and

<http://www.maths.unsw.edu.au/news/2005/SASdatamanagementcourse.html>

<sup>3</sup> <http://www.coop.unsw.edu.au/content.aspx?URL=sponsor/newsponsors/becomingasponsor.htm>

<sup>4</sup> <http://www.universitiesaustralia.edu.au/documents/publications/discussion/National-Internship-scheme-May08.pdf>

<sup>5</sup> <http://my.harvard.edu/icb/icb.do?keyword=core>

<sup>6</sup> An example: Dr Katharine Jefferts Schori gained a PhD in marine biology ('Zoogeography and Systematics of Cephalopods of the Northeastern Pacific Ocean', Oregon State U, 1983) and worked with the National Marine Fisheries Service in Seattle. In 1986 there was a squeeze on the federal research budget. "I couldn't find a job unless I wanted to write grant proposals all the time," she said, "and that wasn't the part of the ocean I enjoyed." She left science and moved to another industry. In 2006 she was elected Presiding Bishop of the United States Episcopal Church, the first female primate in the Anglican communion.

- That HECS and tax policy address the problem of low fertility among graduates (half a child less per degree<sup>7</sup>), caused among other things by the simultaneous crunch around age 30 of beginning a career, taking out a mortgage, having a baby and paying off HECS
- That a national subscription to all academic journals be purchased, so that any IP address in Australia has access to *Nature* and every other academic journal; that would allow, for example, law firms to easily access scientific information for compensation claims, and in general make the results of university research available to the taxpayers who pay for it

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<sup>7</sup> J. Franklin and S. Tueno, [Graduate and childless](#), *Quadrant* July 2003.



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