ENHANCING THE PLACE OF SCIENCE IN UNIVERSITIES
An issues paper

2009 Annual General Meeting
of the
Australian Council of Deans of Science

Review of discipline based teaching costs

In general, science faculties have not been faring well in universities over the last 20 years or more. Student load in many science disciplines has remained static or fallen, while student numbers have roughly doubled across the university system. Distribution of resources in proportion to student load, more or less by the Relative Funding Model, has therefore proved particularly damaging both to the operation and the standing of science faculties. The announcement by the Federal Government of a review of the Relative Funding Model (more precisely of discipline-based teaching costs), brings this issue into sharp and immediate focus. There is an opportunity for us to run new arguments to enhance the place of science faculties. However the arguments will need to be new, since experience of the last twenty years establishes the failure of the usual ones.

There are also considerable threats arising from such a review. The lion's share of science faculty recurrent funding comes from first year teaching. First year subjects are treated as foundational introductions to science disciplines, as opposed to 'cut down' service courses to other disciplines, and this has 'justified' their resourcing, and in particular the associated maintenance of teaching laboratories and technical staff. However, very few of the students in these subjects go on to any kind of research-oriented or laboratory-based career, and they resemble more a service student population than students destined for the science discipline. Furthermore, the recent ACDS/ALTC project on the laboratory experience has clearly demonstrated that both staff (lecturers and demonstrators) and students often have difficulty articulating why the laboratory experience is valuable. Some universities have moved to de-emphasise (or completely remove) the laboratory component in such subjects and a challenge to the historical funding of science faculties and their disciplines is almost inevitable on these grounds.

Refurbishment and equipment renewal

A related challenge is sourcing adequate funding as aging laboratories and equipment come up for refit and refurbishment. Where faculties have invested in a revitalised vision and philosophy of science teaching, as in biology at Monash and University of Queensland, university administrations have responded with excellent refurbishments. Good refurbishment has occurred in other situations on the coat tails of research and other drivers, but generally, where no new vision is articulated for science and its teaching, cost cutting and contraction have been the result. The forthcoming review of discipline-based teaching costs and individual university compact negotiations could amplify this problem considerably.

Science Faculties and research

Research has been the main bulwark against the erosion of science activities. Science brings in big money and caché in research. It is a high profile role model for the view that research is the life blood of any university. The RQF and now ERA exercises have given even greater impetus to this aspect of the operation of science faculties, shifting the balance between teaching and research more strongly toward the latter as the area in which science has a natural advantage. However the idea that research can play the major role in sustaining departments and faculties is shown to be flawed by the collapse of some physics departments who adopted this strategy.

There is a myth in some circles that RQF and ERA demonstrate a renewed commitment to *basic* research that will increase the standing and prosperity of science faculties, since the scales will fall from the eyes of a new generation of university senior executives as they see the importance of research afresh. A renewed commitment to research is definitely underway, but it need not work to the advantage of science faculties.

Science faculties represent a certain historical view of how teaching and research should be organised, not only in science but also in other areas. There may be better organisational structures to be considered, and indeed university senior executives often act as though there is such a holy grail, the quest for which will justify any amount of restructuring. Research institutes are a particularly popular alternative to faculty based research, and show that universities are perfectly happy to support science research in what are, in their view, focussed and efficient ways, but not to support science faculties.

It could and should be argued that science faculties provide the 'biodiversity', 'genetic variability' or whatever, that allows these various science foci to arise, and are best placed to manage their evolution. However, such an argument has not reached any public prominence, if indeed it is made at all, and rings hollow in science faculties that are balkanised as physics, chemistry, biology etc.

Science Faculties and innovation

Challenges such as these are about to be magnified as the 2009 federal budget unfolds. In this budget science expenditure was increased to $8.6bn, a record increase of 25% over the previous year, plus $5.7bn in new funding for higher education, science and innovation over four years, $901m in infrastructure, and increases to the budgets of all public sector research agencies. What emerges, however, is that the Government considers itself to be investing in a strengthened national innovation system; Backing Australia's Ability for real. It expects to see pools of talented researchers engaging in innovation with industry, or at least a far more collaborative research system involving universities, government agencies and industry.

Science faculties by and large did not deliver on this under Backing Australia's Ability, and seem not geared towards delivering this time. On the other hand medical faculties certainly have and engineering faculties are positioning themselves to do so. The last 10 years have seen a decisive shift in research funding away from science in favour of medical research. Having captured the innovations agenda last time, it would be very

easy for medical faculties and institutes to build on this in order to capture the new one. Engineering faculties are also engaged in addressing skills shortages and giving engineering a more innovative image. Science faculties therefore have serious competition for research funds that derive from a policy of national innovation. Unless they project their own vision, others will be seen as the foundation of research necessary for an innovative economy.

HDR and innovation

Postgraduate research education is a good focal point for this last challenge. PhD students are the life blood of any faculty that deals largely in experimental and field work. Government policies such as the RRTMP are driving a considerable expansion in their number. The portfolio of a science faculty's PhD projects gives a good indication of the focus and strength of its research. Such portfolios generally show an overwhelming emphasis on discovery research and very limited emphasis on innovation or industry engagement.

This places science faculties in a pincer movement. On the one hand there will be a growing number of highly educated and articulate PhD graduates, disgruntled and disenchanted because only a small percentage of them will be able to find jobs that maintain their chosen research interests. If they find satisfaction in a new career they will probably consider that to be in spite of rather than because of their postgraduate education. On the other hand there will be a growing clamour of discontent from government and industry that the level of engagement of universities is not what they expected, given the budget outlays, and they are not getting science PhD students or graduates into the workforce to grow the innovations system, or collaborate among agencies and industry as they intended.

Medical and engineering faculties have options for dealing with this. Their place in universities and their fortunes may be considerably enhanced by exercising them while science faculties, if they do nothing, could easily languish. Science faculties need to seize the initiative, and produce a new generation of 'industry engaged' post-graduate students. However, the cultural shift involved for individual academics as supervisors, and for departments and schools, is considerable.

Management in universities

Over the last twenty years, university management has passed from a senior management team consisting of Vice-Chancellors with their deans of faculties to Vice-Chancellors with a team of portfolio based deputy vice-chancellors, often with narrowly prescribed goals linked to performance salary components. In such a management climate, if governments through compact negotiations demand responses to a challenge to discipline based teaching costs, improved first year teaching performance or a more industry collaborative research culture then university executives are most likely to lead their development. If science faculties have developed options already then they are in a position to influence executive responses constructively and assume leadership in the management of science by this process. The place of science will thus be enhanced. On

the other hand, a faculty's leadership and standing in its area will always be diminished if it is seen to be led by senior management.

Issues for the AGM

The 2009 Annual General Meeting of the ACDS is given over to addressing just some of the challenges identified above. The opening sessions will provide more detail and opportunities for deans to provide their perspectives and ideas on the significance of the issues raised, both in general and as they affect their institution. The ACDS Executive has then selected a list of specific issues that it believes provide a focal point for these challenges, and provide the subjects for the later sessions of the AGM. These are:

- A national policy on entry level laboratory programmes; this entails agreeing a philosophy and vision for such programs credible enough to compel universities to reinvestment in them, and for government to acknowledge them in any review of discipline based costs.

- A national policy on demonstrator training; or more importantly, on the level and structure of human resource to be delivered into entry level laboratory classes. This too is imperative as a basis for submissions in relation to discipline costs.

- The mainstreaming of ASELL; how to draw staff and university processes into a national 'peer review' system for laboratory teaching. This provides a much needed science specific paradigm for staff development of teachers and subject developers. It should have a substantial influence on University level policy in these areas. An articulated national approach could win substantial federal government support.

- Should there be a cultural shift towards industry engaged postgraduate research and how can this be achieved.

The ACDS Executive hope that debate on these questions and their variants will allow consensus to emerge on framework of initiatives that can be promoted nationally but with flexibility sufficient to generate local implementations within institutions. It would support deans to take the initiative in dealing with the review of discipline based teaching costs, implications of research funding and other major changes that will flow as the current government's policies unfold.

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