

National Innovation Review

Response from Victoria University

Victoria University welcomes the opportunity to make this submission to the review of the National Innovation System. Victoria University is a dual sector university that educates students from vocational and further education through to masters and Ph D and is developing a research profile particularly committed to applied research that crosses traditional disciplinary boundaries and translational research that makes a difference in improving the lives of individuals and communities, the environment and the economy of our region and the nation. VU research is carried out in partnership with government, industry and non-government organisations.

The University would like to comment on the following:

- Cooperative Research Centres;
- The cross-disciplinary and cross-sectoral nature of innovation;
- Full funding for research and postgraduate research;
- Innovation and the *Excellence in Research for Australia* initiative;
- Issues around innovation and commercialisation of research;
- Issues around innovation and government R&D support programs; and
- Acknowledging and supporting alternative knowledge transfer mechanisms.

Cooperative Research Centres

Victoria University's interest in the Cooperative Research Centre (CRC) program stems from its membership of the Sustainable Tourism CRC (STCRC) and Water Quality Research Australia (WQRA) Ltd, which is a CRC successor.

CRCs are by definition about collaboration between multiple partners, in this case between business and research institutions. In this sense, the CRC program fulfils innovation as collaboration criterion, and is therefore a worthy mechanism to promote and pursue innovation. However, the program has often been marked with high entry costs such that smaller universities must be very selective about their memberships. Access issues to the CRC model are not limited to the Universities, with accessibility also difficult for smaller businesses and industries that are dominated by multiple smaller players.

The Productivity Commission also noted that business collaborators, as the main beneficiaries of the CRC, benefit from high levels of subsidies, which leads one to question the 'efficiency' of the program in achieving its intended aims under the current structure.¹ The Productivity Commission and more recently innovation inquiry chief, Terry Cutler, Director Centre for Business Research (UK) support university focus on their contribution to knowledge transfer particularly through research training, rather than primarily through commercial activity.

Victoria University, as a relatively newer institution with a developing research and commercialisation profile believes that the CRC program is structured in such a way that renders it difficult to take part due to the significant entry costs. The preference for CRCs to source research and innovation from (financially) contributing partners means that we are excluded from a significant source of research and development funds and opportunities.

In addition, for dual sector institutions such as Victoria University where skill and expertise is also held within the Vocational Education sector, the CRC program, with its 'bent' towards Higher Education research and Publicly Funded Research Agencies (PFRAs), shuts out an area of potential collaboration, knowledge and growth.

¹ *Public Support for Science and Innovation*, Productivity Commission Research Report, March 2007.

As such, there should be scope to develop a 'CRC2' type program, which would retain the knowledge transfer, research application development and other elements of the CRC program, but with relatively flexible, less costly and less onerous entry and governance requirements that would enable smaller institutions to collaborate with business and gain the benefits. The program might also enable the Vocational Education sector to engage with the program either alone or through university partnerships.

Innovation crosses disciplinary and sectoral boundaries

Much of the discussion on innovation tends towards viewing it in terms of science based research carried out in certain universities and the publicly funded research agencies. The reality is that innovation is not restricted to traditional scientific and technological research. Innovation and creativity exists in many fields of endeavour, and some of the most innovative work is interdisciplinary research that is applied to addressing significant social issues. An example of 'non-science based' innovation is research conducted by Victoria University's School of Information Systems in concert with others to develop negotiation support systems that promote constructive relationships following disputes.

A 2006 project undertaken by the Council for Humanities Arts and Social Sciences (CHASS)² identifies the amount of research and innovation that crosses traditional disciplinary boundaries and documents the multiple barriers to such activity that are posed by funding, structural and recognition systems that follow traditional discipline based structures and "silos".

The "Wake the Kids" project at Victoria University, which researches how smoke alarms are effective in waking up children aged 5 to 15 years, provides an example. The research will help to understand how likely children are to wake to their home smoke alarm under naturalistic conditions and whether this varies with the age of the child and where the alarm is positioned. Importantly, the research is interdisciplinary and involves researchers from the divergent fields of engineering and psychology.

Limiting the National Innovation System (NIS) to universities and PFRA's also excludes innovation through the Vocational Education Sector. By limiting the sector's involvement in the NIS, the nation will not maximise the adoption of potentially beneficial practical applications of research. The nation should adopt a strategic approach that encourages and facilitates innovation development across sectors. There are a number of reasons why this should be so:

- The Vocational sector is the education sector that applies knowledge and ideas and trains students who directly use this knowledge in their trades and professions;
- The sector is engaged in knowledge transfer on a much larger scale than the Higher Education sector (in terms of student numbers). Engaging the sector in the NIS would directly open a new segment of the Australian economy to innovation;
- The skills shortage currently experienced in the Australian economy is in segments where the Vocational sector has a large share of responsibility for education. Including the sector in the NIS could expose the sector to new processes, ideas and products that could strengthen its role in alleviating the skills shortage.

The Government should adopt an approach that includes and encourages collaboration across all the Vocational and Higher educational sectors, and indeed all sectors of the education and training system.

The national innovation programs that do exist to disseminate knowledge and innovation do not seek to include the Vocational sector.

As such, Victoria University suggests that:

1. New funding models be developed that would simplify the administrative and other barriers to greater cross-sectoral collaboration, innovation exchange and knowledge transfer.

² *Collaborating Across the Sectors*, Council for the Humanities, Arts and Social Sciences, November 2006.

2. In addition to the above, the Government should fund demonstration projects that display the potential benefits from cross-sectoral collaboration. These projects could also act as pilots that would act as positive examples and catalysts towards greater higher education/vocational education collaboration. The knowledge gained from these projects could be used to inform any future projects, and indeed any new funding models.

The above are particularly germane for a dual sector institution like Victoria University. The University recommends that 'green' technologies would prove a fruitful testing ground for these demonstration projects. Particular projects could include the adoption of green engineering technologies in the building sector, the adoption of green design principles in a number of trades and technical areas, and the application of research findings in the transport and logistics sector.

These projects would serve as clear and tangible examples of the application of research to topical 'real world' problems to develop workable solutions.

Research Funding

Victoria University considers that costs of conducting research should be fully funded. This is especially so when considering the knowledge spillovers and community benefits accruing from such research.

Victoria University applauds the Government's intention to increase the number of Australian Postgraduate Awards (APAs). This move recognises the important part played by postgraduate students in research and innovation, and the pending shortage of academics and researchers as current generations retire. However, the University considers that it is not only the number of APAs that should be increased, but also the level of the stipend offered to students. The low level of postgraduate stipends is a significant disincentive to full time higher degree study particularly for older more experienced graduates, those with families and those with professional or employment options. These are often students who are in areas where academic skill shortages are most pressing. In addition, the Government should take action to increase funding to universities to enable them to cover the costs associated with supervision of postgraduate students since this has failed to keep up with the growing costs of support, supervision and facilities for postgraduate students to universities.

A measure of how funding for research costs has fallen can be gained by considering Australian Research Council (ARC) and National Health and Medical Research Council (NHMRC) funding relative to block grant. In recent years, funding for research grants for both the ARC and the NHMRC have grown significantly, while at the same time, funding for research related costs and infrastructure in the form of research infrastructure block grants have not risen. This suggests that universities are being asked to perform more research activities with a relatively (proportionate) diminishing infrastructure and funding base. As a result much university research is now cross subsidised from other university income sources including teaching and full fee income.

As a first measure, the Government should fully fund the costs of undertaking research by at the very least doubling current levels of Block Grant Funding. In addition, the funding should be institutionally based and transparent, so that both Government and institution can take full account and have complete understanding of the purpose and level of funding.

It is also important that any increase in funding take account not only of an individual institution's current research activities and performance, but also consider future growth areas and strategic plans with respect to research. Research funding should address imbalances and enable universities to seed and grow new areas, improve upon existing areas of excellence and strengthen and develop new avenues for research.

Finally, research funding can be used to directly support innovation in industry and with it knowledge transfer through the ARC Linkage program. The ARC Linkage program is an excellent vehicle for leveraging government funds with industry funds into applied research projects. However, unfunded

ARC Linkage Projects total over 60 per cent, suggesting there is a significant opportunity (through the provision of additional government funds to the ARC) to leverage this growing potential investment of funds that is forgone by failure to fund ARC Linkage projects.

Innovation and the *Excellence in Research for Australia (ERA) Initiative-*

The introduction of the ERA in place of the RQF aims to assess excellence in research using existing metrics i.e. largely publications, journal impact factors and citations and to restrict the additional work for universities. The challenge will be to ensure that it does not restrict innovation and the development of applied and interdisciplinary research. However:

- The ERA is to be conducted on a discipline basis. While there may be some merit in this for administrative purposes, it is not conducive to innovation which is increasingly cross-disciplinary and indeed, cross-sectoral (Higher Education to TAFE and vice versa);
- The ERA has excluded any measure of impact. This shuts out an entire mechanism for knowledge transfer, and by doing so, focuses knowledge transfer to particular types (academic journals);
- The ERA, which by definition considers research outcomes with no consideration of impact, excludes (or at the very best severely limits) consideration of any contribution made to the NIS by the Vocational Education sector.

In a world where (innovative) technology has simplified and in some cases enabled information sharing, collaboration and the resulting innovation still depends very much upon the intentions of those sharing.

The ERA, by granting cache to a particular set of international academic journals, may limit the ability of end-users such as business who can apply research outcomes. This is because high academic impact journals are not readily accessible nor are they read by many end users of research. This risks stymieing innovation through the application of research findings.

The paradox for Government is that while the proposed ERA rewards research excellence, it may act against innovation. The challenge for Government is to develop policies that reward quality research while at the same time engendering a culture of collaboration that underpins and supports innovation.

Innovation, Commercialisation and Research

Recognition by researchers and universities of the intellectual property generated through research and intellectual activity is a significant change in the past decade. Nevertheless while the potential value of intellectual property through research is an important component of the innovation system, the belief that the commercialisation of IP will lead to significant income streams to a university or a CRC is optimistic, since income generation from IP commercialisation translates to only 2 to 3 per cent of total revenue streams.

However, a concern regarding the commercialisation of IP (often with concomitant legal instruments such as the patent) is the risk of locking up the free flow of (often publicly funded) research outcomes. As the Productivity Commission has noted, while some community benefits may accrue through the knowledge transfer inherent in the commercial process and the delivery of new and innovative products or processes, the commercialisation pathway may not be the most efficient mechanism to achieve this, let alone the spread of innovation.

Alternative goals, including open access repositories for data and research outcomes, also run counter to the commercialisation model. While open access repositories are about 'pro-innovation' collaborative activity, commercialisation of research discourages open access to research findings and data due to a desire to maximise possible commercialisation options.

Government policy should not encourage universities or CRCs to pursue one knowledge transfer mechanism over another, but should encourage the use of the most efficient mechanisms.

Innovation and R&D Supports

The R&D Tax Concession program, along with other R&D development programs such as the Commercial Ready program, only applies to the natural and physical sciences. The R&D tax Concession in fact explicitly excludes any research that industry may fund in the humanities, arts and social sciences. Australia is primarily a services economy, investment in the social sciences and creative and performing arts has at least an equal possibility of creating innovation, employment generating wealth and export industries.

VU recommends a review of the costs and benefits of the R&D tax concession. Should the decision be to continue the program then all fields of research and potential innovation should be included in the guidelines.

The R&D Tax Concession program's effectiveness is limited in those situations where a firm is starting up and so makes no taxable profit. For many firms at the cutting edge of innovation and technology, making losses (at least in the initial phases) is the 'normal' state of affairs. The biotechnology industry serves as an example of this. As such, in addition to the R&D Tax Concession, the government should look to improve upon existing programs (such as R&D Start or Commercial ready) and develop new programs to support fledgling companies.

Acknowledging and supporting other methods of Knowledge Transfer

The bulk of the knowledge transfer that takes place within the university sector is to and through its students. The process of teaching and training, imparting new ideas, outcomes of research and current thinking, has by far the largest direct reach.

However, the transfer from student to the business and the wider economy generally comes at the completion of the student's official education with the take up of employment and other similar opportunities.

Victoria University aims to make learning in the workplace and the community a universal feature of all VU courses (at least 25 percent). This is the first time that an institution has adopted such an approach for all courses and in all fields, disciplines and sectors.

Importantly, this new feature of Victoria University means that knowledge transfer from student to workplace and the community would take place at earlier stages of the student's training; but it also means that the employers and the community will be directly involved in the education of the student. The new Commitment leads to two-way knowledge transfer, from institution to workplace and community, and back.

While such transfers do currently occur through other mechanisms (such as research), the sheer number of students involved mean that the potential benefits, in terms of innovation spill-overs, would be on a larger scale. The cost of doing this however is not recognised in current university funding formulae.

VU would encourage the review to consider ways in which interactions between universities, their students and business and industry can be funded and facilitated to encourage the development and diffusion of innovation.

Business is continuing to demand that university graduates have a breadth and depth of skills as opposed to graduates being specifically trained for a single job. The cost of this additional training however is not borne by business. There is therefore an incentive and opportunity for business to invest in the training of university graduates through government managed schemes.