
Submission to the Department of Innovation, Industry, Science and Research

Meeting Australia's research workforce needs

Introduction

Griffith University welcomes the opportunity to make a submission to the Department of Innovation, Industry, Science and Research (DIISR) consultation paper on *Meeting Australia's Research Workforce Needs*. Griffith is supportive of the directions taken in the consultation paper and has therefore focussed the majority of its submission on issues not considered within the paper. Griffith also contributed to the submission from the *Innovative Research Universities* and is supportive of its recommendations, several of which are reflected in our submission.

This response builds upon earlier submissions from Griffith to the *Review of the National Innovation System* (2008), the House of Representatives *Inquiry into research training and research workforce issues in Australian universities* (2008) and our feedback to *venturousaustralia* (2009). We acknowledge the enormous progress made in recent years in responding to recommendations arising from these reviews including:

- Commitment to doubling the number of APAs on offer from 4,800 to 9,600 by 2012;
- Increasing the APA stipend to \$22,500 – although the House of Representatives *Inquiry into research training and research workforce issues in Australian universities* called for a 50 per cent increase in the stipend;
- Introduction of the Future Fellowships scheme; and
- Bridging the gap in meeting the full cost of National Competitive Grant research.

In our view the consultation paper does not fully acknowledge that similar commitments are occurring in many other developed economies, not to mention the well-documented 'excellence' programs being implemented in Japan, Korea, Germany, Saudi Arabia, China and Russia to name just a few. Australia must follow suit merely to maintain its place in the world knowledge economy and will need to extend these programs substantially if it is to match the efforts of OECD leaders.

Therefore this submission focuses on the next steps required for Australia to achieve 'first-tier' innovation economy status; a status necessary if Australia is to provide a more attractive and secure employment environment for its future research workforce. Given the position of universities within the innovation system, our submission focuses mostly on the supply side of the equation (research graduates) and the opportunity to develop better qualified, more adaptable research graduates trained in a high quality research environment and with the capability to engage in a wider range of research-based occupations. The role of universities as employers of researchers is also discussed however the supply side is viewed as the more logical focus for immediate action from 2011-2013.

Employer demand for researchers

Question 1

Do the issues identified adequately capture the challenges facing Australia in adapting to the changing nature of employer demand and meeting its innovation aspirations over the next decade? If not, what other challenges should be considered?

Question 2

Do the issues identified adequately capture the opportunities available to Australia to better respond to the changing nature of employer demand in Australia and meet national innovation aspirations? If not, what other opportunities should be considered?

A major challenge for the Queensland economy is its traditional dominance by the agriculture, mining, tourism and building and construction sectors. As a result of State innovation strategies new industries are proliferating including advanced manufacturing, aviation, biotechnology, creative industries, food processing, information and communication technologies, marine, pharmaceuticals, services and venture capital¹. Griffith University has five campuses in the Brisbane-Gold Coast corridor – a corridor which is a beneficiary of much of the transformation occurring.

This growth corridor however contains thousands of Small and Medium-Sized Enterprises (SMEs). This is a significant issue for Griffith University in that while significant innovation activity occurs in SMEs this is mainly in the form of imitation rather than basic R&D. Most SMEs do not consider contacting universities for assistance to undertake R&D. The *Enterprise Connect* scheme will go some way to facilitating interaction with SMEs, including the *Researchers in Business* program of which Griffith has been a recipient (March 2010). Continuation of the focus on SMEs and their evolution into high-technology companies is important to the Griffith catchment and Australia in meeting its innovation aspirations over the coming decade.

With the necessary enabling conditions in place we would hope to see:

- Stronger growth in the number of small emerging technology-based businesses;
- An increasing number of these would be breaking through to become ‘emerging globals’;
- The overall performance of existing Australian companies will improve through the adoption of new products and processes developed in Australian universities;
- A virtuous cycle will be established which will lead to greater investment into knowledge generation creating better value jobs and economic conditions.

Insofar as the opportunities available to better respond to changing employer demand and national innovation aspiration, Griffith acknowledges that the government’s support mechanisms (p.7) are limited mainly to: research training; fellowships for researchers at all career stages; incentives for employers to engage researchers; and visa arrangements to enable researchers to study and conduct research in Australia. One issue that is ever-present in states such as Queensland and Western Australia is the boom and bust nature of the economies which does not encourage best practice in researcher workforce management. Greater engagement between governments and industry will be needed for various sectors to learn how to better manage their research workforce needs through the boom and bust cycles.

Submissions and Evidence contained in the recent House of Representatives Report into *Australia’s International Research Collaboration* (June 2010, p.20-28) points to the embarrassing incidents arising from stringent enforcement of visa regulations resulting in legitimate PhD applicants being denied entry and cases where eminent researchers (e.g. Chinese Academy of Sciences) have been refused visas for periods greater than three months. The Committee also noted the lost opportunities for research collaboration due to the length of the process. Griffith supports the recommendations that flowed from this report including closer collaboration between the Department of Immigration and Citizenship and university HR departments to ensure correct visa pathways are used and streamlining visa processes for researchers and research students.

More can be done at the supply end to ensure that research graduates are more employable in a wider range of occupations through the development of generic skills such as communication, planning and teamwork including preparedness for interdisciplinary occupational types. This supports the notion of longer PhD programs of up to four years to accommodate the inclusion of generic skills coursework elements and the continuation of the Commercialisation Training Scheme which has still to live up to its potential.

In its current form, the Research Workforce Strategy could more clearly articulate how it addresses the National Innovation Priorities and chart how it is integrated and implemented with related government policies and programs. The consultation paper lacks a strategic response in employer demand that is based on emerging and future industry sector needs, which makes the matching and planning for the future supply of researchers and researcher training needs to industry incomplete. For example, the Research Workforce Strategy could explicitly target the future industry needs and emerging shifts in

¹ Smart State, Smart Industries website at: <http://www.investqueensland.com.au>

the industry structure of Australia that have been identified in the Access Economics and Allen Consulting papers and then show how it can be implemented through programs such as Commercialisation Australia and Enterprise Connect.

Griffith University therefore recommends:

- 1. Provision of regular advice outlining future industry needs and emerging shifts in the industry structure of Australia to assist universities to better plan their research training activity;*
- 2. That PhD scholarships provide recipients with greater flexibility to study part-time which will allow for the development of employment skills while studying;*
- 3. Consistency between PhD scholarships and RTS funding so that each are offered for a four year period to enable the inclusion of more generic skills courses;*
- 4. That a National Student Internship Scheme be trialled – aimed at small and medium-sized enterprises.*
- 5. That the four classes of visa now available to researchers and research students be streamlined especially at the point between completion of PhD studies and commencement in full-time employment; and*
- 6. That the suite of programs (including the Commercialisation Training Scheme) supporting research interaction between universities and industry (particularly SMEs) be further strengthened and that consideration be given to outstanding recommendations from venturousaustralia including recommendation 9.5 that a pilot linkage voucher scheme be established to allow up to 5,000 SMEs per year to collaborate with public sector research organisations.*

Supply of researchers for Australia

Question 3

Do the issues identified adequately capture the challenges facing Australia in delivering required levels of research skills to its workforce over the next decade? If not, what other challenges should be considered?

Question 4

Do the issues identified adequately capture the opportunities available to Australia to enhance its supply of research skills over the next decade? If not, what other opportunities should be considered?

The consultation paper points (p.6) out that “not all HDR-qualified individuals are employed in a research capacity and not all researchers are HDR-qualified”. Most responses to the consultation paper will rightly focus on HDR training however there is a need for consideration of research skills at all levels of the Australian Qualifications Framework from honours through to doctoral programs. At a time when several universities are reconsidering the status of professional masters programs and the badging of these as doctorates it would seem logical that a rethink take place on the minimum standards of honours, masters by coursework and research, professional doctorates, research doctorates to ensure that Australian university qualifications remain consistent with global trends such as the Bologna Framework. Part of this review of research skills may also entail a broader definition and articulation of levels of requisite skills required for HDR degrees.

At the same time we need to ask serious questions about the balance between HDR load, completions and attrition rates. The research block grants provide almost \$400 million for completions (RTS, APA and CTS) but only a quarter of that amount through the JRE formula on the basis of load. This offers the perverse incentive for universities to enrol high numbers of students in the hope of these generating completions – while there is no funding recognition for the quality of the PhD

experience. The House of Representatives Inquiry recommended that universities should receive RTS funding for all PhD students and that the funding model be altered to a staggered formula based on 50 per cent on enrolment, 20 per cent on a specified benchmark and 30 per cent on completion. Griffith supports such a recommendation as this would see a dramatic move to quality of training and focus on the PhD student experience, reduced attrition and higher completion rates.

If Australia is to rise to the forefront of research skills development then it must be an innovator. The U.S. *Study of Earned Doctorates Report 2008* which presents data on the 48,802 recipients of research doctorates awarded by 417 U.S. universities confirms that research students in the U.S. are twice as likely to come from overseas, take more than double the time to complete PhD studies compared to their Australian counterparts, are more likely to receive some form of funding support, and less likely to finish their PhD in debt. International graduates in Australia account for around 20 per cent of PhD completions against almost double that percentage in Switzerland, the U.S., and the United Kingdom. Clearly Australia is not yet perceived overseas as a first tier option for PhD studies given that less than five per cent of Australia's international university students are enrolled in doctoral programs² and are concentrated in the broad disciplines of Society and Culture; Natural and Physical Sciences; and Engineering and Related Technologies. Therefore the full solution does not come from overseas.

Griffith therefore would like to see introduced more flexible and innovative arrangements for domestic PhD candidates to enrol in more than one institution; additional funding under the Research Training Scheme to actually accommodate the load currently being carried by Australian universities and stronger alignment of RTS funding with enrolment (rather than completion). A four year funding envelope for PhD programs would allow for the inclusion of at least one semester taught component (e.g. professional research development course on research methods, research project management etc) which would achieve better alignment with international best practice programs.

In our submission to the Inquiry into research Training Griffith recommended a total remission of the HECS-HELP debt for earlier studies upon graduation from the PhD program. There are approximately 4,200 domestic PhD completions in Australia every year. One in three students has a HECS debt of more than \$14,000³ indicating the cost of HECS remission for all PhD graduates would be in the order of \$60-70 million per annum. The University notes that the Inquiry accepted this recommendation (rec.21) and we therefore continue to raise this as an option for making research careers more attractive.

If Australia has one strategic advantage then that is the strength of its \$18.6 billion⁴ (2009) education services export industry. Australia's position as a major recruiter of international students is however tarnished by its reputation in some quarters as a 'taker' aiming at the second tier of international students and offering fewer scholarships than many other developed nations. The solution is clearly to convert APAs to IPRS and we acknowledge that the Department is headed in this direction.

We understand that these proposals would entail enormous financial commitments by the Australian Government however such a nation-building scheme is necessary for Australia to meet the identified issues head-on and remain competitive against its OECD counterparts.

Griffith University recommends that:

7. *The RTS be reviewed, including the high and low cost areas, with a possible view to linking this to the SRE transparent costing settings applied to each university;*
8. *The Government fund the full cost of HDR places at Australian universities through the RTS;*
9. *In doing so more attention should be directed at assessing the quality of research training based on indicators such as load, completions, quality of the research environment, quality of supervision and assessment. These indicators should be consistent with the Framework for Best Practice in Australian Doctoral Programs (Council of the Deans and Directors of Graduate Studies, July 2008);*
10. *The recommendation of the Inquiry into research training that a staggered formula based on*

² Australian Education international (AEI), Research Snapshot, May 2008

³ Australian Bureau of Statistics, Year Book Australia, 2008, Feature Article 2: Higher Education Loan Programme and ABS Year Book 2007.

⁴ AEI, Research Snapshot, May 2010

50 per cent on enrolment, 20 per cent on a specified benchmark and 30 per cent on completion be considered;

- 11. Introduction of National Innovation Priority APAs to provide much more competitive stipends in area of national skills shortage;*
- 12. Alignment of a four year period across all PhD funding schemes: RTS, APAs and IPRS;*
- 13. For domestic PhD graduates, introduce a full remission of the HECS-HELP debt for previous studies;*
- 14. Australia set a target of up to 40 percent of all commencing PhD students to come from overseas within five years, provided this is accompanied by more collaborative arrangements with high quality international partners and does not diminish national commitment to domestic PhD provision; and*
- 15. International Postgraduate Research Scholarships (IPRS) should be doubled to 700 per year by transferring 1,400 of the new 4,800 Australian Postgraduate Research Awards over a four year period.*

Finally, Griffith University does not support the linking of Excellence in Research for Australia (ERA) and HDR training at present. Our position in the recent response to the SRE Threshold consultation paper is that the ERA initiative, even without any link to block funding, has prompted universities to reconsider the way in which they focus research into areas of excellence in order to position themselves for outcomes which will shape reputations for years to come. The British Research Assessment Exercise was not linked to funding until 1992 – six years and two cycles after its inception in 1986.

Research Career paths

Question 5

Do the issues identified adequately capture the challenges facing Australia in providing productive and viable career paths to its researchers over the next decade and promoting them adequately? If not, what other challenges should be considered?

Question 6

Do the issues identified adequately capture the opportunities available to Australia to better support researchers at the different stages of their careers over the next decade? If not, what other opportunities should be considered?

In our view the consultation paper effectively canvasses the myriad of issues associated with provision of stable career paths for researchers. It is no longer adequate to assume that the attractiveness of research as an activity will direct people along career paths with a highly uncertain structure/future. This involves increasing financial incentives for those undertaking a PhD and providing better career structures and job security for early career researchers.

We acknowledge that the project-based nature of many research projects, especially within Australian universities, contributes to the uncertainty of research careers and that this could in part be solved by an expansion of mission-based schemes and programs of up to 10 years duration. Griffith supports this proposal as it would go some way to solve the mismatch between career development timeframes and funding periods which allows insufficient time for many to develop publication and grant records.

Researchers themselves appear unaware of the breadth of opportunities available and the possibilities to transit into non-academic or non-research roles and back again. We agree with the consultation paper that more can be done to map and publicise the opportunities but this needs central coordination by governments (Commonwealth, State and Territory). Griffith strongly supports any initiatives to better articulate career paths for researchers.

The Government might wish to consider programs between universities and government agencies

including PhD internships in government and Work Integrated Learning opportunities (e.g. whereby research students undertake six month placements and/or subsidised secondments within government departments or commercial organisations). Griffith is highly supportive of the continuation and growth in programs such as Enterprise Connect's *Researchers in Business* program.

In previous submissions Griffith has argued that untapped benefits arise from having one million diaspora (around 4.5% of its population) and several million international student graduates. In the past we have proposed a range of coordinated programs aimed at improving 'brain circulation' with the resultant flow meaning that new knowledge and ideas occurring anywhere in the world are absorbed much faster into the Australian economy and society. Griffith proposes the creation of a new *International Knowledge links Program* with the following schemes:

Proposed International Knowledge Links Program
<p>Visitor scheme – expatriates</p> <p>To attract expatriates for short or long-term stays to transfer knowledge and expertise gained overseas.</p>
<p>Visitor scheme – international visitors</p> <p>Aimed at enabling universities to create permanent adjunct positions for international researchers to engage with Australian universities from their overseas bases with a focus on maintaining networks, conducting joint research and transfer of knowledge into Australia.</p>
<p>Visitor scheme – research students (two way flow)</p> <p>This scheme might provide scholarships for domestic and international research students some of whom might be studying under joint supervisory or joint degree arrangements with an overseas partner.</p>

Griffith University recommends that the Government:

16. Increase early and mid-career researcher security and stability through more program-based grant opportunities;
17. Extend the duration of the of Future Fellowship scheme and double the number to 2,000;
18. Create an International Knowledge Links Program incorporating existing schemes and creating a range of new 'visitor' schemes aimed at attracting expatriates, adjunct staff, international alumni and research students to Australia.

Priority areas for action

Question 7

Are the priority areas for action outlined in Table 1 the right ones? What other priorities should be identified?

Question 8

Does the allocation of responsibilities for priority areas and actions outlined in Table 1 adequately capture the roles of the all parties? Are there any issues relating to the allocation of responsibilities that need to be considered?

Question 9

Are the timeframes outlined in Table 1 appropriate? Are there any priority areas that require more immediate or longer-term action?

The table outlining the proposed priority areas for action reads well and allocates the responsibilities for action appropriately between Government, universities and other research training providers, and research employers (including universities). Griffith understands from consultations that the priority actions may be reduced and agrees with this given the large number of actions and the costs associated with implementation. Timeframes set for short, medium and long-term actions are appropriate – any beyond 2020 would be purely speculative given global trends will undoubtedly change within the next 10 years.

One action that possibly should receive higher priority is:

“Development of more robust systems for monitoring supply and demand of researchers in Australia over the longer term and tracking the career outcomes of research-qualified individuals.”

That Australia does not have such systems in place is problematic and presents public policy challenges since funding programs are often designed around incomplete data. Griffith proposes that this be seen as a more immediate challenge, not necessarily for implementation in 2011-2013 but certainly for planning of such systems to commence.

Other priorities requiring immediate action (2011-2013), broken down into low-cost and higher-cost initiatives are:

Lower-cost initiatives

- *PhD scholarships which provide recipients with greater flexibility to study part-time to allow for the development of employment skills while studying;*
- *That the classes of visa now available to researchers and research students be streamlined;*
- *The RTS be reviewed, including the high and low cost areas; and*
- *International Postgraduate Research Scholarships (IPRS) should be doubled to 700 per year by transferring 1,400 of the new 4,800 Australian Postgraduate Research Awards over a four year period.*

Higher-cost initiatives

- *That Government fund the full cost of HDR places at Australian universities through the RTS;*
- *Alignment of a four year period across all PhD funding schemes: RTS, APAs and IPRS;*
- *For domestic PhD graduates, introduce a full remission of the HECS-HELP debt for previous studies;*
- *International Postgraduate Research Scholarships (IPRS) should be doubled to 700 per year by transferring 1,400 of the new 4,800 Australian Postgraduate Research Awards over a four year period; and*
- *Create an International Knowledge Links Program with ‘visitor’ schemes aimed at attracting expatriates, adjunct staff, international alumni and research students to Australia;*
- *Increase early and mid-career researcher security and stability through more program-based grant opportunities; and*
- *Extend the duration of the Future Fellowship scheme and double the number to 2,000.*

Other recommendations made by Griffith are prospective medium to long-term actions.

Conclusion

In responding to this Consultation Paper we recognise that there are no easy solutions. The Bradley Review of Australian Higher Education report (Chapter 3) grapples with this issue by examining both the supply and demand sides of this equation. The prevalent view appears to be that Australia will continue to suffer skills shortages in several professional areas served by the university sector and that it needs to increase the supply of higher education qualified people.

Demand for researchers can be stimulated by more employers realising the benefits of undertaking R&D and the value of employing suitably qualified individuals to perform research over workers with alternative qualifications. Supply of researchers can be much better attuned to the current and projected needs of the labour market instead of being a random process. Achieving researcher workforce equilibrium is not impossible and it is clear that better mechanisms need to be developed by Governments in consultation with stakeholders to inform the actions of both the higher education sector and employers.

This submission by Griffith University has attempted to be sufficiently pragmatic in reconciling these competing interests and recommends a series of necessary actions if Australia is to remain on equal footing with the more advanced OECD economies.

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