

HOUSE OF REPRESENTATIVES INDUSTRY, SCIENCE AND INNOVATION COMMITTEE

INQUIRY INTO RESEARCH TRAINING IN AUSTRALIA

THE UNIVERSITY OF MELBOURNE SUBMISSION IN SUPPORT OF THE Go8 SUBMISSION

PREAMBLE

The University of Melbourne is Australia's largest single Research Training provider, with the largest Research Higher Degree (RHD) enrolment of Australian Universities, and the highest number of RHD completions.

The University of Melbourne is supportive of the Go8 submission to the House of Representatives Industry, Science and Innovation Committee's inquiry into research training and research workforce issues in Australian universities. This response commences with a summary of the University's key recommendations. The responses to individual issues raised by the Committee were drawn from contributions made by members of The University.

SUMMARY OF KEY RECOMMENDATIONS

The University of Melbourne recommends to the Inquiry that:

- Commonwealth funding schemes addressing research training should continue to reflect outcomes;
- The level of funding should reflect the costs of training research students, and that these costs should not be cross subsidised from funding sources provided for other activities;
- The scholarships available for RHD students should be increased in value and length of tenure to reflect the increased costs of living and the average period of candidature of research training students, but that any increase should recognise that all research training positions should be funded at a rate that allows candidate participation without candidates seeking additional employment;
- The Commonwealth provide direct funding to support the development of transferable, generic skills programs, academic mentoring and apprenticeship schemes, and career pathways for RHD students and early career researchers as happens in the UK;
- Strategies be developed and supported to ensure that Australian universities are well placed to meet the challenges of an ageing academic workforce, by providing clear career development pathways for graduate researchers;
- Australian Universities have the capacity to compete internationally for high quality graduate researchers;
- While the objectives of the Commercialisation Training Scheme are laudable, the current CTS strategy should be re-evaluated.

The following submission addresses the quasi 'terms of reference' and is a summary of the responses from University of Melbourne Research Training stakeholders. Stakeholders were asked to provide responses to the specific questions raised by the House of Representatives Industry, Science and Innovation Committee's inquiry into Research Training.

SECTION ONE

The contribution that Australian universities make to research in Australia including:

Research Training programs make a major contribution to Australia's competitiveness and add significantly to cultural, political and regional development;

The University of Melbourne is a national and international leader in research and research training and the largest Australian research organisation after the CSIRO. Our high standing in global rankings (e.g. Times Higher Educational Supplement and the Shanghai Jiao Tong index) reflects this strong research performance, in part measured by Graduate Researcher completions and publications. The University strongly affirms that **research training is critical to the social and economic development of any country but especially to a growth economy such as Australia**. Research training is essential for individuals both within and outside the Academy, since the framing, testing and reviewing hypotheses are essential skills in the global 'knowledge economy'.

Research Training (predominantly doctoral training) has been used by developed countries to build industrial capacity and doctoral trainees make essential inputs into the political, cultural, social, artistic, legal, commercial and technological growth of nations. Much of this country's fundamental research activity, both discovery and strategic, is undertaken by RHD students. Graduate Researchers are academic 'apprentices' and their research contributes to the international knowledge base, evidenced by the publication output of RHD students and their contribution to research productivity and innovation - in the United States, Japan, Korea, Finland and France, for example, it is argued that the Academy contributes strongly to the definition and testing of industry and government policy. Through well supported research training, Australia can perform a leadership role within the region and positively influence regional development.

The current Commonwealth research training schemes could be much more effective;

Research Infrastructure: IGS, RTS and RIGB

In 2007 the Commonwealth allocations to fund The University of Melbourne research infrastructure comprised: IGS \$35.5 million; RTS \$63.5 million; and, RIGB \$25.8 million. There is a strongly held view across the University *that the relative level* of Commonwealth funding received on the basis of publications, grants and research student completions has declined over the period 2005 to 2008. The rate of growth of these three schemes has been significantly less than the rate of growth of the inputs that determine the funding allocations. The University strongly asserts that funding has not kept pace with the increase in research activity and outputs.

It is clear that **funding must be sufficient to support the full cost of research**. The increase in National Competitive Grant funding has not been matched by parallel increases in infrastructure funding such as the IGS/RIGB/RTS. The RTS in particular has been severely limited with only a 6% increase in total over the period 2005-08, such that it now barely covers the cost of administering student training, let alone the cost of performing the research. There is an inherent assumption that the Graduate Research supervisor(s) grants will fund the research performed by the student. This is not a sustainable model in the laboratory-based disciplines, and is a severe restriction on capacity of institutions to train RHD students in quality, appropriately-resourced environments. The University would specifically like to raise the issue of the RTS funding formulae that supports RHD students. The decline in funding per RHD completion and per research dollar is clear evidence of the lack of support for the real costs of research and research training.

The University of Melbourne community identified a number of issues regarding the drivers or measures that infer quality in relation to research activity:

(a) That the support schemes that **focus on training outcomes** (principally completions e.g. RTS) have been effective in changing Research Training (RT) culture - that other measures such as publications, which speak to the quality of the outcome, should now be included in the remuneration metric - especially those outcomes of research which reflect ongoing research activity i.e. recruitment of RHD graduates into the research employment market. There is strong support for increasing the weight assigned to research publications and perhaps other 'drivers' that relate to quality and not simply quantity.

(b) publication lead times - if publications are to be assessed as a remuneration driver, it will need to be recognised that any requirement that publications must be completed by the end of candidature in order to attract funding, could lead to an excess of quantity rather than quality. This issue needs to be considered carefully.

(c) tracking of publications – in some disciplines publications arising from the thesis are not formally 'published' within two years from the thesis completion date. While publishing "as you go" is common in some disciplines, in humanities many students are encouraged to postpone publishing until the whole PhD can be published as a book. There is agreement that getting a candidate through in a timely fashion is desirable, it is far more fraught to try to define and measure quality. The concern is that a science suitable model would prevail over humanities.

(d) the issue of appropriate metric for research outputs in the humanities and creative arts is an ongoing structural issue that is being argued in other for a (eg. the ERA). This metric will have an impact on research training. The proper resourcing of libraries is fundamental to graduate research in the HASS (Humanities, Arts and Social Sciences).

(e) Australia appears to be lagging behind its economic peers in providing research training opportunities, and research output, particularly in relation to its domestic student cohorts. One example is in RT in the Built Environment. Although the production of international scientific publications has long been on a par with that of other OECD countries, research activity in the built environment has been grossly under funded. The number of grants awarded in the area is small, and a large proportion of Graduate Research students come from outside Australia. Thus, Australia is currently contributing more to the training of international students, who return home, than domestic students, further weakening the discipline in Australia.

The current research training schemes to support Australia's anticipated future requirements for tertiary-qualified professionals in a wide range of disciplines are clearly inadequate;

The higher education sector must recognise that **research training demographics vary**, even within the Go8 universities. Any assumption that RHD candidates are full-time, early career and young is clearly unsafe. Untaxed stipends to support Graduate Research should be more accessible to part-time candidates (presently only full-time scholarships are untaxed), and scholarships should be made available to allow short periods of full-time activity by part-time students. In short, much greater flexibility should be attached to research training support.

In respect to University allocations within the scholarship schemes (APA/IPRS), the RTS formula which comprises: 50% weighting for RHD completions; 40% weighting for research income; 10% weighting for research publication, is currently used. The University of Melbourne believes that this **RTS formula is well aligned** (albeit NOT the level of support attached) with the important measures of Graduate Research success, and generally reflects the level of research activity within a University.

The level of support distributed through the RTS is inadequate both in respect of the number of training places and in the level of support for these places: in summary,

- There has been no increase in the number of RTS-funded places at The University of Melbourne (UoM) since 1999;
- Since 1996, at UoM, we have received 11 more APA scholarships for a total of approx 1500 more commencing students;

- Stipends are currently set at \$20,007 which is very low compared to graduate starting salaries and below the poverty line. [2008 UoM Graduate Marketing Recruitment Plan, section 3.1.5:10]

It is critically important that the level of research training support be reviewed. The current stipend arrangements are grossly inadequate (number, level and tenure of stipends) and that **support needs to be provided to both candidate and supervisor**, especially where the candidate is in a laboratory- or other infrastructure-dependent environment. If Graduate Researchers are to be seen as junior Faculty then their remuneration, as happens in the EU, should be aligned with this perception. While stipends need to be increased, research support packages should also be provided to ensure that Graduate Researcher projects are internationally competitive. The current model acts as a strong disincentive for students to undertake research that is not directly related to topics that have already received funding, i.e. it is anti-innovation. The current scheme where scholarships are allocated without further support diminishes the pool of supervisors - supervisors of laboratory-based projects, without other support, cannot support RHD students.

Increasingly, RHD students cannot afford to conduct their research training on a student stipend. The reduction in the relative value of the stipend has forced students to work part-time which has a negative impact on both time to complete, and completion rate. Many Graduate Researchers are in their late '20s and early 30's, and must make significant financial and sometimes social (e.g. family) sacrifices to undertake research training. The internationalisation of the RHD experience, and the expectation that some of the research will be undertaken abroad, requires considerably better support.

The University strongly supports an increase in the value of research training stipends. Stipends have fallen from 50% of average weekly earnings, to 33% in recent years. APA scholarships are highly competitive and excellent students (i.e. those with First Class Honours degrees) are left unsupported. The University of Melbourne currently ranks some 1600 RHD applications each year and provides stipends to less than 1/3 of these applicants. However, any attempt to lift the level of support must be part of a holistic package of reforms that address research training. At present, The University of Melbourne provides many more scholarships funded directly by the University, than Australian Postgraduate Awards (APAs). If the APA rate is increased then additional support must be provided to Universities to allow them to match the Federally-funded APAs. In the current University support environment, failure to provide this additional financial assistance could result in a large decrease in the number of University-supported awards, which will also need to be increased in value.

The University strongly believes that more funds are required for the Endeavour International Postgraduate Research Scholarships (*IPRSs*). IPRS funding does not fully cover the course fees, thereby reducing the number of IPRSs offered. These scholarships are awarded to the top international RHD applicants who have a history of timely RHD completions.

The Commonwealth Government's Endeavour Scholarship Program could be simplified. A single, flexible pool to cover the myriad of Endeavour programs could be provided to Universities, with an indicative allocation. The IPRSs financial reporting requirements should also be simplified. Currently, a break down of expenditure by recipient and expenditure type (tuition fees, health care cover) is required. For the APAs, institutions need only to report total expenditure for the cohort.

Calls for research training in specific discipline areas may be difficult to meet. For example, the Commonwealth has invited universities to apply for new nursing and teaching places in response to skills shortages in those professions. The ramp in providing research training in these areas will inevitably be slow, because the infrastructure (supervision, physical etc.) necessary to support these study areas will need to be rebuilt. The same will be true for many of the HASS areas in the coming years.

The University recommends that the effectiveness of the Commonwealth's *Commercialisation Training Scheme [CTS]/Graduate Certificate in Commercialisation for Research Students [GCCRS]* should be evaluated. There are a number of issues in relation to the CTS:

(1) *Pressure for timely completions and work overload:* The reluctance of supervisors to allow research candidates to undertake 6 months of coursework whilst enrolled in a full time RHD prevents some candidates from enrolling in the GCCRS. Despite benefits for the student undertaking the course, timely RHD completion seems to be a greater concern and the intense activity required to complete a RHD is incompatible with the workload demands of advanced coursework. One solution would be to make funded places in the GCCRS available to researchers who have completed a research degree. Allowing research candidates to remain enrolled in the GCCRS after completing their RHD is another option.

(2) *Commercialisation potential of research:* the lack of engagement in the GCCRS may reflect that many RHD candidates have a limited grasp of 'commercialisation' and therefore may not consider the GCCRS to be of value. Other candidates, working in disciplines where the research undertaken has commercial potential, will often have signed third party or confidentiality agreements which will limit engagement.

SECTION TWO

The challenges Australian universities face in training, recruiting and retaining high quality research graduates and staff, including, but not limited to:

Adequacy of training and support available to research graduate students in Australia;

The University asserts that there are a range of training issues that the Inquiry needs to consider, particularly the provision of opportunities to **develop transferable, generic skills**. The nature of RHD training has changed - academia is no longer the primary endpoint for the majority of students. Students require strong generic transferable skills over a broad range of disciplines so they are prepared for a diverse range of occupations. The RHD program should incorporate training programs to match these skill requirements. Doctoral training should provide generic, transferable skills that are required across society. Supervisors need to have the appropriate training to match the different aspirations of the students. Through the Melbourne School of Graduate Research the University offers a range of online resources as well as short courses, workshops and seminars to develop: communication and presentation skills, IT and research skills, academic and writing skills, critical thinking and professional and leadership skills to enhance employability and provide opportunities to encourage success.

The University of Melbourne is developing the Melbourne Advanced Studies Award, a high level (ie. doctoral) formal award course to help graduands develop management proficiency – to develop an understanding of ethics, leadership, governance, responsibility and essential allied skills and learnings. **Flexible funding schemes** are required to support highly valuable initiatives such as the MASA.

In this era of 'lifelong learning', The University supports the needs and expectations of mature candidates in many professional fields (such as Education). The average age of research students in Australia is mid-30s, and a quality experience of research training requires what can be called a 'living wage'.

The 'globalization' of research is now well accepted and RT candidates benefit from an international experience in many ways. International exposure will typically raise the quality of the research training experience, improve the outcomes measured by completions and publications, provide the candidate with an international network, increase the profile of Australian research, engender confidence and subject the RT data interpretation and conclusions to additional expert scrutiny. It is essential that this international experience be better supported. Candidates will not fully leverage the international exposure if they are poorly resourced and cannot, for example, attend networking opportunities or are forced into third or fourth tier accommodation when participating in an international conference. The Federal government should make travel funds available to RT candidates on a competitive basis and provide other resources eg. access to diplomatic missions to ensure that the training experience is fully exploited.

Factors for graduates that determine pursuit of a career in research;

The factors that impact career decisions will often be discipline-specific. In preparing this response the University of Melbourne community were informally surveyed and identified the following factors as common **drivers for graduates that determine whether they pursue a career in research**:

- Opportunities and interest
- Funding and an inadequate stipend
- Employment prospects, creation of incentive schemes for beginning level academic positions and varied entry points and pathways
- Well trained supervisors and contact with a scholarly community of leading researchers
- Mentoring and peer support
- Growth in new areas such as e-Research require the development of new academic, professional and technical staff classification bands and pathways
- Facilities and infrastructure
- Quality of the Research
- Quality of the institution
- Perception of work/life balance

The University of Melbourne strongly affirms that there **MUST** be rational, tiered schemes to support the development of research-only staff from the junior to most senior levels, and mobility within the academic sector, and between the academy and industry, should be facilitated.

There are common career issues facing Graduate Research students. There is limited access to career planning and transition-to-work support programs for research trainees. Although 93% of Melbourne PhD graduates are employed within 4 to 5 months, 70% working in areas directly related to their degrees, Graduate Researchers believe that they need the following generic skills – ‘self marketing’, articulating transferable skills, approaching employers, networking, working in teams, preparing curriculum vitas, demonstrating a business orientation, career planning and exploring career options and matching employers’ requirements.

There are environmental factors which strongly influence decisions regarding research training. For example, the favourable economic conditions enjoyed by the Australian construction industry over the last 10-15 years help explain the limited pool of Australian research trainees in the Built Environment: within a buoyant industry, research training and a research career have not been competitive in terms of salaries, even for those who join the industry as fresh graduates. The level of post-graduate funding is insufficient to attract, support and retain good minds against competition from industry. The mining ‘boom’ has similarly impacted research training in geology and engineering.

This situation will be only be redressed by action on several fronts:

- 1) to publicise the role of universities and research centres so that industry becomes aware of the human and intellectual capital available;
- 2) to make research culture and training more pervasive by reaching out to their ultimate beneficiaries;
- 3) to make resources available to attract future researchers; and
- 4) to provide opportunities for research demonstration projects and pilots.

Opportunities for career advancement for research graduates and staff;

The University of Melbourne research training stakeholders suggest that the following factors are significant in providing opportunities for **career advancement for research graduates and staff**:

- Funding
- Employment prospects
- Quality of research-related facilities

- Quality of support for research training and postdocs, publications, overseas exchanges and conferences
- Quality of the institutions

There is a general view that once Graduate Researchers complete their training, there is a lack of a satisfactory career structure in academic research. A career that is dependant on a 3 year grant cycle with typically a 20% success rate for an Australian Competitive Grant is, understandably, not attractive to especially older doctoral graduands with financial commitments. Funding research-only staff appointments on external grants and through collaborations with Australian and overseas research partners was identified as an effective strategy to increase the cohort of research-only staff.

Factors determining pursuit of research opportunities overseas;

The globalization of research has meant that international experience is very desirable – it is important though that Australia presents a competitive academic environment, lest successful graduate researcher pursue their careers internationally. In summary the following factors were identified as key drivers in the pursuit of research opportunities overseas:

- Funding
- Employment prospects
- Establishment of key industry contacts and professional networks
- Access to international collaborators and communities
- Facilities
- Quality of Research and Supervision in Research Area
- Quality of the Institution

There is clearly a tension between providing opportunity for an international experience and the impact of well-trained researchers leaving Australia for an indefinite stay overseas. It follows that Graduate Researchers will make a decision based on the factors listed above and that Australia must offer world-class opportunities against these descriptors.

The University strongly supports the allocation of additional resources to provide an international experience for research students and staff. That the globalisation of research makes it essential that Graduate Researchers enjoy an international training experience.

The international trend towards addressing major global problems (e.g. climate change) through multi-disciplinary research must be recognised. There needs to be better mechanisms to ensure multi-disciplinary research is evaluated more fairly against discipline-focussed activity by the major funding bodies.

There was the view that in comparison to most major European countries, we live in a country with limited support for the arts. RHDs are essential for emerging Australian musicians and composers to connect with an environment that fosters artistic excellence, productivity and peer review ie. nationally and internationally. Consequently, RHDs are a springboard for many musicians/composers to take the next steps into the national and international arena. Similarly the PhD graduands in Creative arts are a growing cohort with strong capacity building impact, particularly in the interdisciplinary and design innovation fields.

Australian Universities must be proactive in developing linkages with other, leading international universities to allow our RHD candidates to spend time either studying (e.g. exchange type projects) or engaging in international symposia or conferences. Some government funding for such exchanges or the development of international networks of universities that can undertake some joint training of research candidates (an example is the ATLAS scheme <http://centers.law.nyu.edu/atlasdoctorate/agora/2008/summerinstitute.htm>) will assist in attracting a RHD cohort who wish to study in Australia but who desire some international experience. It can also enrich and internationalise the training that candidates receive.

Australia's ability to compete internationally for high quality researchers; and

The University of Melbourne suggests that Australia will attract international researchers and trainee researchers if the country provides a competitive, supportive and well-supported Graduate Research environment. The country should facilitate the retention of these extremely highly skilled potential migrants. The view was expressed that if we are to foster a truly international research environment, then we should be offering many more scholarships to international applicants. These students will bring different and wider cultural perspectives to the University, and will facilitate international collaborations, which are typically fostered by personal relationships, rather than other non-personal incentives. An analysis should be undertaken to determine whether eliminating fees for international PhD student would attract trainee researchers.

The sustainability of institutions such as The University of Melbourne as a world class research institution will depend on its staff. Most Australian universities engage in workforce planning to reflect future strategic directions and to take into account the institutions' long term academic needs. Succession planning, providing professional development and career opportunities, staff support, "state of the art" facilities and modern human resources policy frameworks demonstrate an institution's commitment to attract and retain high calibre research staff. Australia's ability to compete internationally for high quality researchers depends on a joint investment by the Commonwealth and the tertiary sector.

Whether Australia's academic workforce is ageing, and its impact on research capacity.

It is broadly acknowledged that at current rates of PhD completion and academic staff retirement, there will be a significant shortfall of PhD graduates in Australia in the near future. The impending retirement of large numbers of 'baby boomer' academics will create some opportunity.

The Academy is at risk of being short of young academics, especially in the HASS. The ever tightening of the financial climate has made less resources available for 'casual' teaching and many more Graduate Researchers are passing through the University with no or very limited access to teaching activities such as tutoring, lecturing and demonstrating.

The net flow of academics into and out of Australia must be recorded. At present it is unclear whether the loss of very capable young researchers to the international research community is matched by inflows. Australia must find a way to facilitate the retention of highly skilled potential migrants, possibly by building professional opportunities into research training schemes. This would be attractive in the professional disciplines where there is considerable disparity between salaries with and outside the Academy.

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