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NTEU Submission

to the

Standing Committee on Industry, Science and Innovation: Inquiry Research Training and Research Workforce Issues in Australian Universities.

2008

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Part A.

Summary
The NTEU represents the professional and industrial issues of over 28,000 staff employed at Australian universities. Our membership comprises academic, research, administrative, technical and other general staff employed at Australian universities.

NTEU welcomes this opportunity to make a submission to the Standing Committee on Industry, Science and Innovation in relation to its *Inquiry into Research Training and Research Workforce Issues in Australian Universities*.

As drivers of a knowledge-based economy, Australia's universities provide education and training for skilled graduates and create wealth and employment across a range of industries through the creation, dissemination and advancement of knowledge.

In this submission, NTEU addresses issues of concern in research training and the research workforce in Australia's higher education sector. As such, the submission highlights the roles played by universities both in research and in the education of future researchers. While these are different functions, they are very much interrelated and are essential to the effective functioning of Australia's innovation system.

In this submission NTEU will address both the type and nature of the research undertaken by Australia's universities and highlight the unique role that this research plays in Australia's science and innovation system as a whole. We also illustrate the different and complementary roles played by higher education and business in Australia's overall Research and Development (R&D) effort.

NTEU believes that universities play a distinctive role as educators of future researchers, and that existing research staff employed in universities are integral to this process. There is no doubt that Australian universities are faced with significant challenges in training, recruiting and retaining high quality research graduates and staff, particularly in the context of an ageing academic workforce. Without adequate career progression and recognition of the value of the work conducted by university researchers, these challenges will become even more difficult to overcome. Australia's research efforts may suffer through a decrease in basic research output and our ability to produce research graduates capable of working in applied, experimental and strategic research endeavours may be compromised.

Should the Committee wish to discuss any aspect of NTEU's submission or recommendations, please contact Paul Kniest (Research and Policy Co-ordinator) on 03 9254 1910 or email pkniest@nteu.org.au.

Recommendations

1. The Government needs to address the declining number of higher degree research (HDR) enrolments at Australian universities to ensure that Australian universities, industry and government have a sufficient pool of highly skilled and qualified people for their future needs.

2. In order to ensure that HDR students receive the highest quality of supervision it is critical that the efforts of academic staff involved in supervision are appropriately recognised and rewarded and given the necessary support and training.

3. Universities need to have greater certainty with respect to the level and funding which will be made available to develop and maintain world class research infrastructure. We recommend that the level of infrastructure funding and the conditions attached to receiving funding from the newly established Education Investment Fund are clarified as a matter of some urgency.

4. The NTEU has the following specific recommendations in relation to the Research Training Scheme (RTS):

- **The relationship between the level of RTS funding and government supported HDR student must be more clear.**
- **Current funding levels need to be increased to ensure they cover the full cost of educating and training HDR students.**
- **Existing cost weightings used for HDR students in different discipline areas (based on data collected in the 1980s used to develop the relative funding model) must be reviewed to reflect current cost differentials over a broad range of discipline areas.**
- **It is essential to ensure that the real value of future RTS funding is maintained through an appropriate indexation to ensure that the quality of education or training HDR students receive is not compromised.**
- **Assess whether the introduction of a significant weighting on HDR completions in the RTS funding model has had any impact on the mix between PhD and Masters HDR students, and/or the proportion of students electing to enrol on a part-time basis to overcome the tighter time limits imposed by the RTS funding rules.**

5. Reductions in funding levels, time limits on and the value of student scholarships should not be solely focused on the cost of delivery but should also take into account the quality of the educational experience and the extent to which HDR students are able to engage in collegial activities.

6. NTEU has the following specific recommendations in relation to the Australian Postgraduate Award (AWA):

- **That the APA stipend be increased by 30% so that the living allowance is above the Henderson Poverty line**
- **That the APA stipend be indexed to CPI and be non-taxable (in all forms)**
- **That the term for an APA be extended to 4 years for a full time PhD**
- **That Commonwealth scholarship guidelines allow greater flexibility for taking the APA part time, thus providing stronger incentives on part of the student to complete their studies in the relevant time.**

9. If universities are to be in position to attract HDR graduates to research careers, it is critical that the level of government funding for research:

- **Covers the full cost of undertaking the projects including full compensation of staff costs at level at an appropriate to reflect the level of qualifications.**
- **Gives universities the capacity to offer research dedicated staff more secure forms of employment and provide research staff with a appropriate staff development and opportunities for career advancement.**

10. Universities are facing considerable challenges in relation to the recruitment of new staff to replace the ageing academic population. NTEU supports the following strategies, as proposed by Professor Hugo in his research on the ageing academic workforce:

- **Introduction and support of 'New blood' programmes;**
- **Early recognition of new talent;**
- **Family friendly policies;**
- **'Bringing them back' programmes to repatriate former staff and students of the university;**
- **Developing joint international exchanges in teaching and research;**
- **Incentives to keep 'high flyers' in the university;**
- **Gradual retirement programs for selected staff; and**
- **Accelerated promotion for key staff.**

Part B

1. Research Capacity

1.1. The Contribution of Australian Universities to Research in Australia

Universities play a significant and critical role within Australia's research and innovation system. Not only are universities a major source for research and development (R&D) activity within the Australian economy, they are also responsible for the education of Australia's future researchers.

The latest data shows that in 2004-05 Australia's universities spent approximately $4.3billion on R&D, which accounted for 27.2% of total Australian R&D expenditure in that year.

Table 1: Expenditure on R&D by Type of Activity 2004-05 (% Shares)

Type of Research	Business	Government	Higher Education	Private Non-Profit	TOTAL
Pure basic	4.7%	9.2%	**82.9%**	3.2%	100.0%
Strategic basic	14.4%	33.6%	**43.7%**	8.3%	100.0%
Applied	44.4%	22.5%	29.7%	3.4%	100.0%
Experimental development	88.2%	5.5%	5.3%	1.0%	100.0%
TOTAL	53.6%	16.2%	**27.2%**	3.1%	100.0%

Source: ABS *Research and Experimental Development All Sectors* 2004-05 Cat No. 8112.0

The significance of our universities is even more important when expenditure is disaggregated by type of activity. As the data in Table 1 shows, universities are the most important source for pure basic R&D expenditure (82.9% of total), strategic basic R&D expenditure (43.7%) and only second to business in terms of applied R&D expenditure (29.7%). The only area of research and innovation where universities are not a major contributor is in relation to experimental development R&D expenditure, which is dominated by the business sector at approximately 88.2% of total expenditure.

Differences in research areas are also present when university and business R&D is examined. Research expenditure by research field shows that universities are major generators of R&D expenditure in relation to the following disciplines;

- humanities, arts and social sciences;
- medical and health sciences;
- maths and physics; and
- biological sciences.

While business R&D expenditure tends to be concentrated in:

- information, computing and communications;
- engineering and technology; and
- chemical sciences.

The reasons for such contrasts are varied. It is true that high risk, experimental and developmental research, particularly in fields of engineering, chemical sciences and information technology, are often associated with high costs and specialised infrastructure (although it should be noted that medical research can also be quite specialised). The emphasis for business is on prospective commercial returns, and whilst there is a risk, it is calculated over relevant financial timeframes.

In contrast, research budgets for institutions are comparatively tight and have many contrasting demands. The high risk element may therefore prove to be a barrier, and as such, projects that are deemed as high risk may not attract funding in the first place. It is part of the role of the university to support new and innovative projects, which in the long run may produce significant future outcomes.

Complexities also exist in the process for commercialisation or in patenting the results of any research with institutions seeking to work in partnership with commercial entities in developmental research. However, such partnerships may create potential problems or conflicts in terms of intellectual property and academic rights, including academic freedom and appropriate arrangements for the ownership and dissemination of data. NTEU has always maintained that academic freedom must be preserved in whatever arrangement is agreed to between a university and its commercial partner.

Universities provide the basic research building blocks that support other kinds of research and play a significant part in fostering research outcomes.

1.2 Human Resources Devoted to Research & Development (R&D).

Given the pivotal role of universities in research activity, it is not surprising to see that universities devote significant resources to their R&D activities. Data from 2004 shows universities contributed the equivalent of 56,809 person years to R&D activities, which accounted for 47.6% of total human resources engaged in R&D activities in that year (Table 2)

Table 2: Human Resources Devoted to R&D 2004-05 (% Shares)

Type of Worker	Business	Government	Higher Education	Private Non-profit	TOTAL
Researchers	28.0%	10.4%	**58.4%**	3.2%	100.0%
Technicians	67.7%	27.9%	**0.0%**	4.3%	100.0%
Other Staff	31.6%	16.9%	**48.7%**	2.8%	100.0%
TOTAL	34.9%	14.2%	**47.6%**	3.3%	100.0%

Source: ABS *Research and Experimental Development All Sectors* 2004-05 Cat No. 8112.0

It is also worth noting from this data that over half (58.4%) of R&D staff in universities are classified as researchers, highlighting the pivotal role that universities play in supporting research training and development.

This last point highlights the high costs of investing in the development and support of appropriately qualified and skilled people in R&D; in what is normally referred to as the human capital. Table 3 shows the breakdown in R&D expenditure by the type of expenditure for 2004-05. As the data shows, the share of total expenditure spent on staff or human capital varied considerably by sector. The highest proportion of investment was 56.8% in the Government sector, while Higher Education, despite carrying almost half of the human resources load for R&D, invested significantly less (41.8%) in human capital.

Table 3: R&D Expenditure by Type of Expenditure 2004-05 % Shares					
Type of expenditure	**Business**	**Government**	**Higher Education**	**Private Non-profit**	**TOTAL**
CAPITAL					
Land, buildings etc	1.2%	2.8%	2.1%	2.0%	1.8%
Other Capital	5.0%	4.2%	4.3%	6.1%	4.7%
CURRENT					
Labour	43.4%	56.8%	41.8%	49.7%	45.3%
Other	50.4%	36.1%	51.8%	42.2%	48.2%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: ABS *Research and Experimental Development All Sectors* 2004-05 Cat No. 8112.0

This apparent anomaly can be explained by the data presented in Table 4 which disaggregates for Higher Education the human resources devoted to R&D activities by the type of person involved.

Table 4: Higher Education Human Resources Devoted to R&D 2004		
	Person Years of Effort (PYE)	**% of TOTAL PYE**
Academic Staff	15226	26.8%
Other Staff	9075	16.0%
Postgraduate Students	32508	57.2%
Total	56809	100.0%

Source: ABS *Research and Experimental Development Higher Education* 2004-05 Cat No. 8111.0

This data clearly shows that of total effort in human resources devoted to R&D, Academic Staff account for 26.8%, Other Staff 16.0% and Postgraduate Students 57.2%. In other words, more than half of the human resources devoted to R&D effort in our universities are undertaken by higher degree research students, who may or may not be supported in their research endeavours through scholarship or other financial arrangements.

While the high level of contribution by higher degree research students to our universities R&D effort helps to explain why universities spend less on R&D labour effort than other sectors, it also highlights the other critical role our universities play in the innovation system – namely as the educators of our researchers.

PART C

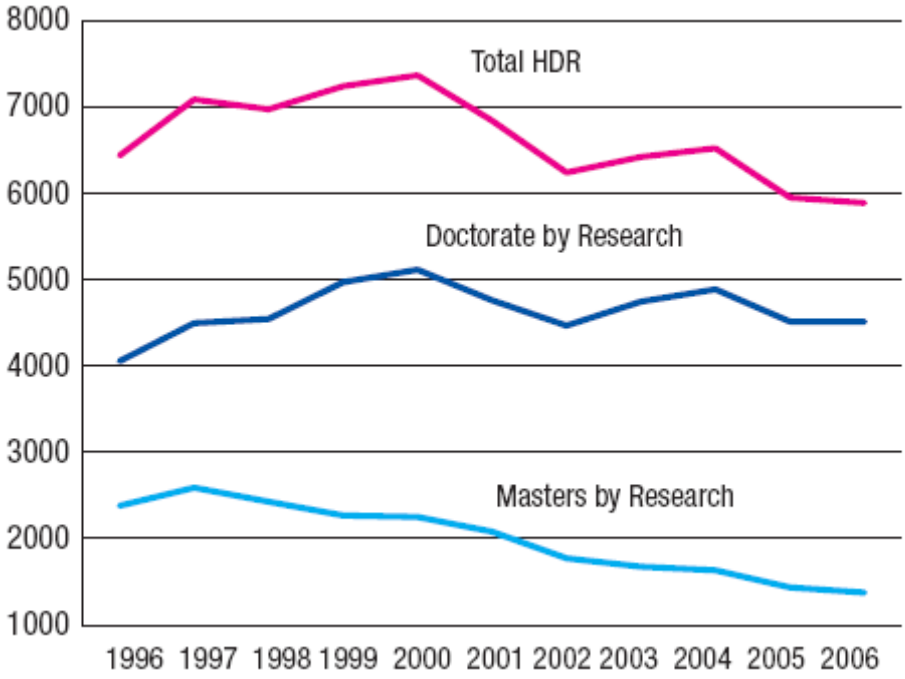
2. Research Education: A Critical Component of Australia's Research and Innovation Agenda

2.1 Current Capacity for Research Education

In 2006 there were over 50,000 higher degree research (HDR) students enrolled at Australia's universities. This was made up of 40,511 research doctoral students and 8,956 Masters research students. In total, higher degree research students accounted for 5% of all university enrolments in 2006.

However, in terms of total numbers, there has been an overall decline of HDR students since 1995, with university data showing a 29% decline in HDR domestic commencements, falling from 8298 to 5885 in 2006 (Chart 1).

Chart 1 - Commencing Student Load for Domestic Higher Degree Research students, 1996–2006



Source: DEST, *Higher Education Student Statistics,* various years

The data in Table 5 show the commencement rates for HDR students by broad discipline, with Table 6 breaking this down further into fields of study. In a number of fields critical in terms of Australia's environmental sustainability and economic competitiveness, there are low commencement rates for PhDs. These include earth sciences, environmental studies, mining-related engineering, accounting, banking and finance.[1] There are also low rates of commencement in health sciences, particularly in dental, optical and radiography studies; areas which already are suffering from skills shortages.

[1] Group of Eight Background Paper, *Researcher Supply and Demand - no 3*, 2007

Table 5: Commencing domestic PhD student load by discipline group, 2006

Discipline group	Domestic PhD commencements
Natural & Physical Sciences	1,130
Information Technology	189
Engineering & Related Technologies	349
Architecture & Building	56
Agriculture, Environment & Related Studies	152
Health	672
Education	271
Management & Commerce	273
Society & Culture	1,192
Creative Arts	228
Total	**4,510**

Source: DEST, *Higher Education Student Statistics,* various years

Table 6: Commencing domestic PhD student load (EFTSL), 2006 (selected fields of study)

Field of study	Student commencements
Mathematics	81
Earth Sciences	65
Information Systems	38
Manufacturing Engineering	21
Process & Resources Engineering	64
Geomatic Engineering	10
Dental Studies	18
Optical Science	3
Radiography	4
Accounting	25
Banking, Finance & Related Fields	16
Forestry Studies	4
Fisheries Studies	3
Environmental Studies	53

Source: DEST, *Higher Education Student Statistics,* various years

The decline portrayed in Chart 1 highlights a hidden crisis in research education. Australia's academic workforce is aging, with research showing[2] that two thirds of Australia's academic staff are over 40 years of age. With at least 25% of this workforce set to retire by 2015, there are concerns within the sector that the time needed to attract and train and mentor HDR candidates, coupled with the increasing diversity of employment outcomes for PhD graduates, will not be sufficient to compensate for the loss created by these retirements. In fact, it is estimated by the Group of Eight (Go8) universities that Australia would need to increase their graduate output by at least 800 more PhDs per annum simply to *maintain* the current number of PhD graduates within our academic workforce. While recent DEWRR data shows that in 2007 there was a 14% increase in enrolments of HDR students from 2006 (with 7094 HDR places)[3], this figure falls far short of the required numbers. Furthermore, any desire to generate additional growth in the skilled research labour necessary for Australia's R&D output, whether within our universities or any other relevant sector, will require substantially higher rates of HDR enrolment and conferrals.

[2] Hugo, Graeme; *Workshop on PhDs in the Humanities, Arts and Social Sciences*, CHASS Conference, Sydney, 2008
[3] DEWRR, *Higher Education Statistics*, Canberra, 2008.

2.2 Supervision

Research education in Australia's universities would not function without the contribution of research supervisors. The supervisor provides instruction and assistance to the research student, reviewing and providing constructive criticism of written work, and acts as a sounding board for the student's research and writing.

Considerable attention has been paid to the training and role of supervisors, given the importance of the professional relationship existing between a supervisor and their student. By supporting the candidature of their research student, the supervisor effectively becomes a mentor, assisting not only the development of research skills and critical inquiry, but also providing important collegial support. However, it is equally important that the supervisor is supported by their institution, and that the vital work they carry out is recognised in terms of their overall workloads.

NTEU supports the principles espoused by CAPA[4] that promote quality supervision in research training, including the establishment and monitoring of relevant codes of conduct and practice in supervision. It should be noted, however, that such requirements should be regularly assessed in terms of their impact on the capacity of supervisors to be effective in their roles as teachers and mentors. For example, while the emphasis by some institutions on supervision of candidature by established and/or research active academics is designed to ensure quality of supervision, it may also have the unintended effect of restricting supervisory opportunities for new academics and researchers. Similarly, while in general supervisors and co-supervisors should have minimum qualifications equivalent to the level of degree they are supervising, there may be instances whereby non-academically qualified experts may be deemed equally appropriate.

NTEU is concerned that while the role of supervision has been historically reviewed in terms of quality, little attention has been paid to the support, training and workload that supervision entails. Much of the work is unrecognised, and supervision is generally paid for out of Research Training Scheme funds, which are limited and have competing demands. NTEU supports further investigation into improving supervisory training and support, and calls for the recognition of duties associated with supervision within workload models and research funding.

2.3 Research Infrastructure

Another important issue that is integral to the research culture of the university is the quality of university research infrastructure. It is impossible for research to be conducted if universities are unable to provide their research staff and students with the appropriate work spaces and physical resources needed. CAPA notes that some of the internal audits conducted by universities in recent years have identified major research infrastructure deficiencies:

> *The University of Sydney's 2000 audit found that even though the provision of resources had improved significantly since the previous audit in 1995, future progress in a number of faculties was impeded by a "lack of physical space" (The University of Sydney, 2001: 13). Macquarie University found that "infrastructural problems for postgraduate students exist, most severely in the Humanities and Education areas, and less acutely in the Science and Technology College (but still of concern)" (Macquarie University, 2001: 3)*[5].

Funding for research infrastructure has been a significant issue for universities for a number of years. While there are a variety of existing Commonwealth Schemes[6] that directly or indirectly support investment in university capital and research infrastructure, these have not been able to

[4] CAPA *Model for the Conduct of Postgraduate Research,* Melbourne, 2003

[5] CAPA *Implementing the Research Training Scheme: The consequences for postgraduate research students, 2002, pg* 23

[6] These include the Institutional Grant Scheme (IGS), the Research Infrastructure Block Grant Scheme (RIBG), the National Collaborative Infrastructure Strategy (NCRIS) and many small schemes such as the Capital Development Pool (DEST),Linkage Infrastructure (ARC) and Enabling and Equipment Grants (NHMRC)

entirely address the backlog in university maintenance[7] which includes research infrastructure. This deficiency was initially addressed to some extent with the 2007 announcement of the Higher Education Endowment Fund (HEEF), although there were some notable restrictions on the access and amounts available from this Fund[8] Thus the recent announcement of the $500 million one-off block grant to universities, together with the potential benefits of the $11 Education Investment Fund (EIF), (which rolled in the HEEF) have been well received by the sector, although it should be noted that the detail of the EIF, such as eligibility requirements and limitations on grant amounts, are yet to be announced.

2.4 Adequacy of Support in Research Training

Senior research management within universities[9] cite that barriers to further capacity building relate primarily to the need for improved resources in HDR student support and training. In essence, this relates directly to the provision of scholarships, the adequacy of stipends, the availability of supervisory expertise and training, as well as physical resources. Current Government policy aims to provide this support through a variety of measures, most notably via the Research Training Scheme (RTS) and the Australian Postgraduate Award (APA). However, the Australian Council of Deans and Directors of Graduate Studies (DDOGS) maintain that many of the current provisions for research training and support are insufficient; in their recent submission to the Federal Government's Innovation Review (2008), DDOGS notes that:

> *In a competitive world market, current Australian HDR scholarships are inadequate both in value and duration. Globally institutions are offering more attractive packages to the best and brightest students. Whilst the DDOGS applaud the recent Rudd Government announcement that it will increase the number of new Australian Postgraduate Award (APA) scholarships provided each year from 1580 in 2008 to 3500 by 2012, at around $20,000 per annum tax free, the value of PhD stipends paid under the scheme is considered insufficient to meet the living expenses of students. The value of these scholarships has not kept pace with inflation and the Council for Australian Postgraduate Associations (CAPA) has reported that the stipend rate for APAs will slip below the poverty line by the end of 2008[10]. A significant increase is required as well as an indexation process to maintain parity for the future[11].*

DDOGS further notes that:

> *Since the Research Training Scheme (RTS) was introduced, the total pool has not kept pace proportionately to the increase in enrolments and completions across Australia. Many universities over enrol their RTS allocation and consequently the funding per capita has diminished significantly. The number of RTS places does not reflect the increases in population nor provide for the growth in the proportion of the population able to undertake a PhD to move Australia closer to the OECD average[12].*

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[7] The submission by the Group of Eight to the HEEF inquiry notes that in 2005 estimations by DEST set the 'deferred maintenance' expenditure (ie the level of maintenance expenditure that should have been undertaken but was not due to insufficient funds) to be at $1.5 billion. The submission also noted that in 2006, the total deferred maintenance liabilities across Go8 universities alone was been estimated at $1.53 billion. (Group of Eight, *Submission to the Inquiry into the Higher Education Endowment Fund Bill 2007 (Cth),*Canberra *2007, pg 3).*

[8] The HEEF was announced as part of the 2007 Federal Budget, and aimed at projects that supported the development of approved strategic research infrastructure. The funding pool was derived from the proceeds of the investment of the fund, limiting the available funding pool. As well as being a competitive grant system, it was stated that applications with matching funding would be viewed favourably.

[9] Australian Council of Deans and Directors of Graduate Studies (DDOGS), *Submission to Innovation and Research Review*, 2008, pg 3 – 4.

[10] CAPA Media Release, *APAs to Break Poverty Line*. April 30 2008.

[11] op. cit., pg 3

[12] op. cit., pg 4

There has been considerable criticism within the sector that the RTS policy and funding formula is complex and unwieldy, and, more importantly, that it fails to adequately compensate for the full cost of research training.

2.5 The Research Training Scheme

The *Higher Education Support Act (HESA) 2003 Other Grants Guidelines 2006***,** the objectives of the Research Training Scheme (RTS) are to:

- *enhance the quality of research training provision in Australia;*
- *improve the responsiveness of higher education providers to the needs of their research students;*
- *encourage higher education providers to develop their own research training profiles;*
- *ensure the relevance of research degree programmes to labour market requirements; and*
- *improve the efficiency and effectiveness of research training.* (8.10.15)

The Guidelines also state that RTS grants provide:

> *block grants, on a calendar year basis, to eligible higher education providers to support research training for students undertaking HDRs - Doctorate and Masters degrees by research - including coursework components of these degrees, provided that the coursework components do not exceed one third of the degree.* (8.10.1)

and that:

> *'RTS students', are exempt from payment of student contribution amounts and tuition fees for units undertaken as part of an HDR course of study.* (8.10.5)

2.5.1 Allocating the RTS

The formula used to calculate the distribution of the RTS funding between individual universities is very complicated and it is not immediately apparent what the basis for the RTS funding allocations is at any given period.

The NTEU understanding is that RTS funding is a block grant which is distributed by a formula which distributes three-quarters (75%) of each year's allocation on the basis of a sliding scale of the previous three years' RTS grant amounts (indexed to current year values), with 25% of the RTS being distributed on the basis of each university's RTS performance index. The components of the RTS performance index are outlined below:

Table 7. RTS Formula; Relative Weighting of Performance Indicators

Weighting applied	Performance Indicator
50%	HDR student completions: weighted by type of course Masters or Doctorate, and high cost or low cost and the relative cost of discipline areas
40%	Research income
10%	Research publications

Source: *Higher Education Support Act (HESA) 2003 Other Grants Guidelines 2006*

In addition to the funding formula a safety net is applied which ensures that each universities block grant is at least 95% of its previous year's grants.

The RTS provides universities with operating funds for the education and training of Higher Degree Research (HDR) students and is not intended to cover any of the capital costs including access to specialised equipment or infrastructure which HDR students may need to access in order complete their research.

RTS funding formula is complex, and the 75% of the RTS which is not distributed based on the RTS performance index seems to be based on the assumptions of providing a maximum of four years funding for a PhD student and two years for a research Masters student. In addition it divides students into two broad categories of low and high cost disciplines. Science-technology-engineering-medicine (STEM) disciplines are considered high cost disciplines while humanities-arts-social sciences (HASS) disciplines are considered low cost disciplines. High cost discipline students are funded at 2.35 the rate of low cost students, with this differential based on data collected in the late 1980s under the relative funding model.

This approach is clearly outdated as it does not take into account changes in technology and research over the last two decades. For example, HASS students may now require access to similarly expensive equipment and specialised workshops (for example, in art, design, communications and music).

More importantly, it is argued by many within the sector, including the Council of Humanities, Arts and Social Sciences (CHASS) in its *PhD Five Point Plan proposal (2007),* that the *nature* of postgraduate research in humanities and arts often results in students working on individual projects, separate from their supervisor's research and, as such they require individual supervision and mentoring.

In contrast, STEM students may work on group projects and thus share experiences, facilities and even supervision time, as well as being mentored by post-doctoral colleagues. As such, CHASS argues that in these situations, they may require less per capita supervision time than HASS students.

In reality there is widespread criticism of the RTS in terms of overall funding, with some degree of variation between RTS revenue and the real costs of delivery in almost all discipline areas.

2.5.2 Adequacy of RTS Funding in Real Terms

The decision to introduce the RTS scheme was taken in 2000, with funding commencing in 2001. The domestic HDR student load (full time equivalent) value of RTS grants for the period 2001 to 2007 are shown in Table 8 (below). In addition, the table shows the value of RTS grants per full HDR student in both nominal and real 2008 values when adjusted for the consumer price index (CPI) .

The level of RTS funding over the period has only been increased by the Higher Education Index Factor, which is a weighted average of changes to the safety net wage rate (75%) and the Consumer Price Index (25%). The increase in the value of the RTS grants has not been sufficient to maintain their real value or to allow for the increase in the HDR student load and, as a consequence, the real value of RTS funding per domestic HDR full time equivalent student has declined by 9% over the period.

Table 8. Domestic HDR Full Time Equivalent Load and RTS Funding 2001 - 2006

Year	Doctorate	Masters	Total RTS Student Load	RTS Funding $'000	Funding per HDR Full Time Student	Real (Adjusted for CPI) Funding per HDR Full Time Student (2008 Values)
2001	19,608	5,493	25,101	504,495	$20,099	$24,567
2002	20,072	5,219	25,291	515,563	$20,385	$24,206
2003	21,088	5,006	26,094	527,399	$20,212	$23,201
2004	22,112	4,753	26,865	540,797	$20,130	$22,659
2005	22,434	4,448	26,882	552,153	$20,540	$22,587
2006	22,657	4,154	26,811	562,644	$20,986	$22,409
Change since 2001	***3,049***	***-1,339***	***1,710***	***58,149***	***887***	***-2,158***
% Change	***16%***	***-24%***	***7%***	***12%***	***4%***	***-9%***

The data also shows in real terms (2008 values) that the level of funding per domestic HDR full time student in 2006 was $22,409. The question is whether this is sufficient to cover the full cost of educating and training HDR students. If we are to use the relative funding model as a basis for the indicative cost of educating different types of students, then the relative cost weights for HDR students are 2.0 for low cost discipline groups and 4.7 for high cost discipline groups. Data shows that in 2006, approximately 56% of the HDR student cohort were enrolled in what are classified as high cost discipline areas, with the weighted average for HDR students at 3.5. Based on 2008 CGS funding rates the base amount of funding universities receive (Commonwealth Contribution plus students HECS fees) for humanities undergraduate students (relative funding model weighting of 1) is in the order of $10,000, then a reasonable assumption is that it would cost a university $10,000 x 3.5 per full time HDR student or $35,000 per student. Based on the data presented above, this would indicate, that on average RTS funding falls short of full cost provision by a approximately $13,000 per FTE HDR student.

Supporting this argument is recent data produced by Monash University, which illustrates the variation between HDR revenue per EFTSL and associated costs (see Table 9) in a selection of high and low cost subject bands. There is considerable variation between the subjects, but all are in the negative – for example, the deficit in the Science band is approximately 17%, while in Information Technology it is considerably higher at 55%. In addition, it should be noted that this data does not take into account 'hidden costs'[13] – for example, unpaid external supervision or additional resources provided by the department.

Table 9: Monash University HDR Revenue and Costs Per EFTSL (2005 - 2008)

Year	Cost Centre	HDR Revenue per EFTSL	HDR costs per EFTSL	Variance
2005	Science	$27,756	$33,513	-$ 5,756
2006	School of Rural Health	$36,905	$56,377	-$19,472
2008	Art & Design	$15,166	$29,000	-$13,833
2008	Information Technology	$17,091	$37,804	-$20,712

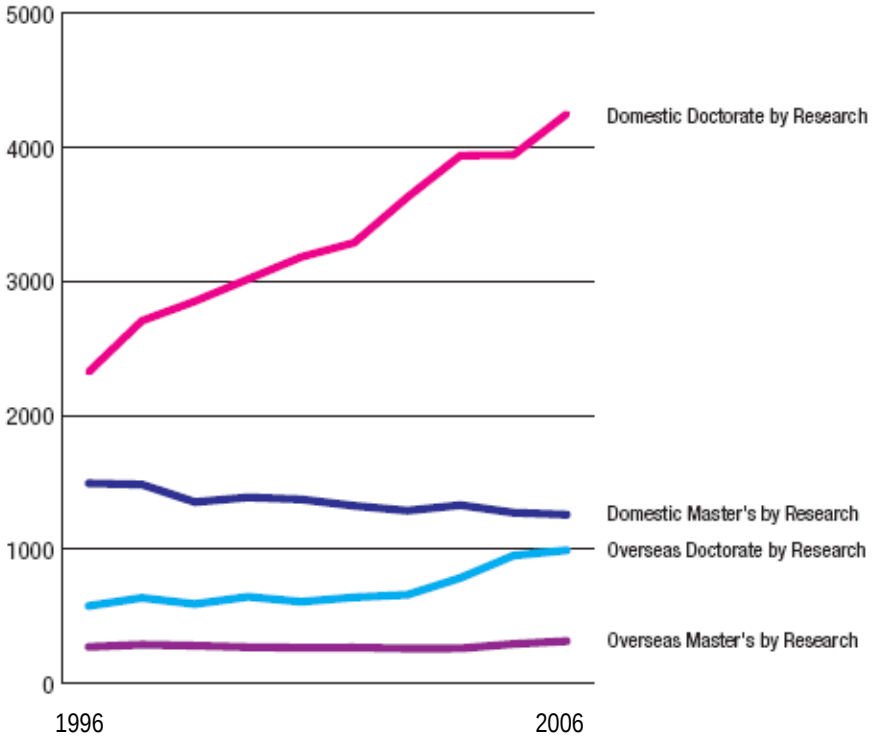
Source: Monash University Presentation *PhDs in the Humanities, Arts and Social Sciences,* Sydney March 2008.

It should be noted that the emphasis in RTS funding on completion is not without some controversy within the sector. Originally intended to promote completions, it would appear that this policy approach has succeeded in this particular aim: DEST data in Chart 2 (below) shows the rates of

[13] op. cit., pg 4

HDR completions between 1996 and 2006, where a rise in PhD completions coincides with the introduction of the weighted formula for completion.

Chart 2: Higher Degree Research completions, Australia,1996–2006



Source: DEST, *Higher Education Student Statistics*, various years

However, it is also worth noting that there has been a decline in Masters by Research completion at the same time. Although some of this decline is likely to be related to the upgrading of candidature from Masters to PhD studies by a few students, there is evidence that some institutions have previously prioritised the resourcing and support of PhD candidatures in terms of policy, funding and scholarships.

There has also been the unrestricted spread of postgraduate studies by coursework. Once a relatively minor area, changes in institutional funding and an increased emphasis on entrepreneurial policy within institutions has seen an explosion of these high fee courses, with the greatest growth at Masters level. Table 10 shows the increased commencements in Masters by Coursework from 1999 to 2006, with an overall increase of 78% from 1999 numbers. It should be noted, however, that whilst there are many well designed coursework degrees available, such courses typically have a lower research component, and do not effectively contribute to R&D efforts overall.

Table10. Commencing EFT Students in Masters by Coursework, 1999 – 2006.

Year	Commencing EFT students
1999	15,224
2000	17,109
2001	38,222
2002	55,367
2003	62,532
2004	65,532
2005	64,176
2006	65,251

Source: DEST, *Higher Education Student Statistics,* various years

The emphasis on completion has also had an unintended impact on aspects of collegiality and postgraduate participation in the broader university community. In particular, CAPA has noted a "flow on effect" in many institutions, where the increased pressure for timely completion has coincided with a marked reduction of the numbers of postgraduates participating in collegial life of their institutions. NTEU believes that a vital component of academic skills training is the development of collegial links and networks. The limitation on time may have the opposite effect, with postgraduate students feeling disconnected and isolated from their university community.

This problem can be compounded for postgraduates also engaged in casual teaching, adding considerable pressure on their timelines for completion. However, as many of these postgraduates rely on income from casual employment as their main source of income, they are neither likely to refuse any offer of work, or actively seek a reduction in teaching hours.

2.6 Scholarships

2.6.1 The Australian Postgraduate Award (APA)

The main objectives of the Australian Postgraduate Awards (APA) programme are to:

> *1. support postgraduate research training in the higher education sector; and*
> *2. provide financial support to domestic postgraduate students of exceptional research promise who undertake their higher degree by research at an eligible Australian higher education provider.*

The scholarship program provides Commonwealth funding to approved institutions under the APA program, with the majority of scholarship support currently awarded to domestic postgraduate students. Institutional or industry scholarships are also offered, but are more restricted in number and availability, and typically provide less funding to the recipient. As such, the APA program plays a pivotal role in Australia's research training program.

APA funding is allocated to universities on the basis of research performance. Applications by students for an APA are made directly to a participating institution, and it is the responsibility of institutions to determine the selection process by which awards are allocated to applicants. APAs are awarded to Australian citizens, New Zealand citizens or holders of permanent visas, the intention being to assist with general costs of living.

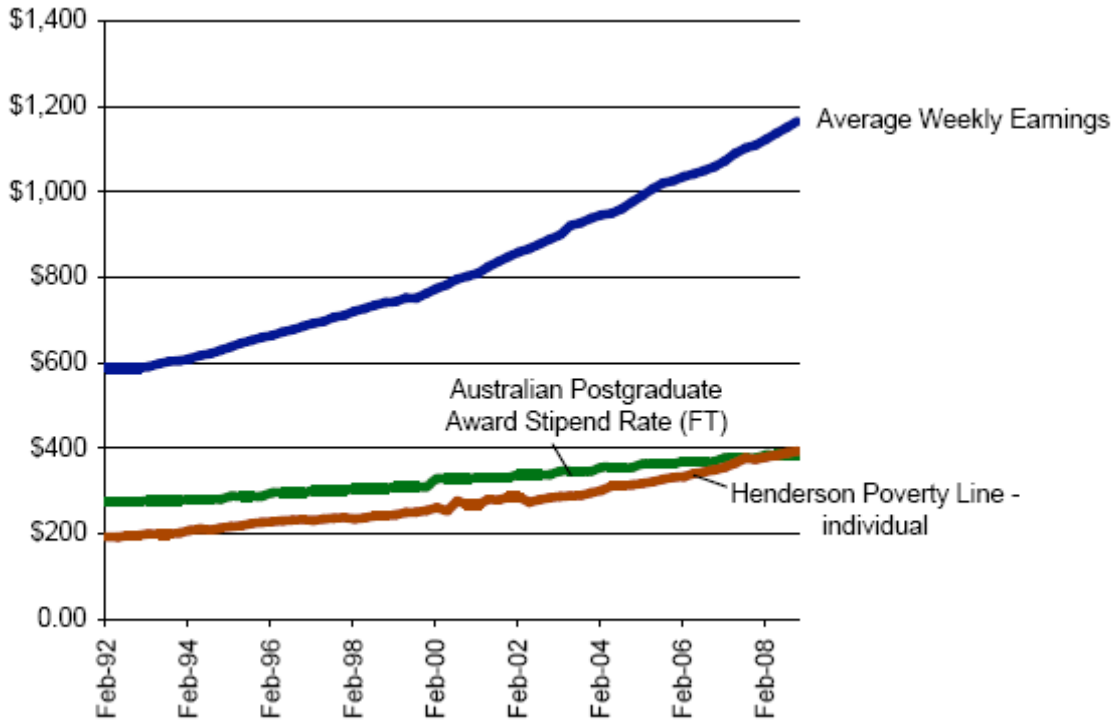
Awards are available for a period of two years for a Masters by research degree or three years, with a possible extension of six months, for a Doctorate by research degree. Award holders receive an annual stipend, currently set at $20,007(non-taxable) for full-time students and $10,710 (taxable income) for part-time students (2008 figures). APA scholarship holders may also be eligible for other allowances.

Recent Budget announcements saw the Federal Government increase the number of new APA scholarships provided each year, from 1580 in 2008 to 3500 by 2012. However, the stipend for a full time APA remains unchanged at around $20,000 per annum. Even though the full time stipend is tax-free, its value has not kept pace with inflation, and this figure is considered insufficient to meet the living expenses of students.

In support of this argument, CAPA has reported that the stipend rate for APAs have not only failed to keep pace with average weekly earnings, but argues that this rate will slip below the poverty line by the end of 2008[14] (see Chart 3).

[14] CAPA Media Release: *APAs to Break Poverty Line*. April 30 2008.

Chart 3: Australian Postgraduate Award Stipend Rates with Average Weekly Earning and Henderson Poverty Line



Source: CAPA, Media Release: *APAs to Break Poverty Line*, April 2008

In addition, research has shown that those postgraduates who have carer responsibilities whilst dependent upon the APA for support have been below the poverty line for some time (see Table 11).

Table 11. Comparison Between AWE, HP Data and APA Stipend, 2007 - 2008

	Average Weekly Earnings	Henderson Poverty data - individuals			
		Two dependents	One dependent	No dependents	APA Stipend (full time)
December quarter 2007	$1,110	$581	$480	$374	$377
December quarter 2008 (projected)	$1,165	$611	$505	$394	$385

Source: CAPA, Media Release: *APAs to Break Poverty Line*, April 2008

CAPA, DDOGs and NTEU have advocated for a 30% increase in the stipend rate, an increase that would restore the stipend to a level above the Henderson Poverty line and ensure that the APA serves the purpose for which it was intended – to enable research students to focus on their studies.

Both NTEU and CAPA have called for all scholarships and awards to be exempt from assessable income for taxation and income support purposes (including part time awards). NTEU also agrees with proposals by CAPA and DDOGs for the APA to be fully indexed with CPI. Such measures are vital if we are to ensure that the value of the API maintains its future parity and continues to be of relevance to our research training endeavours.

2.6.2 Part-time Higher Degree Research Students and APAs.

The emphasis on [15] completion has also coincided with a marked increase in part-time PhD candidatures. According to DEST figures, part-time students now comprise 25% of candidates, with approximately 10% going 50/50 between full-time and part-time status. While there is anecdotal evidence that some postgraduates choose part-time status to extend the timeline for completion, this is not the case for the majority of part-time APA scholarship holders.

Instead, research has shown that the link lies in the coinciding rise in DEST figures of the proportion of women undertaking postgraduate studies, with almost 50% of PhD candidates in 2007 being female (in 2001, this figure was 42%). Given the average age of a PhD student (around the mid 30's) it is not surprising that many have family commitments, and as part-time candidature is usually only permitted by the institution because of health or family reasons (such as having carer responsibilities) one would expect there to be a link between the increase in the participation of women and part-time enrolment. According to CAPA:

> *Students may choose to study part-time and/or externally for a variety of reasons. The majority of postgraduate research students are over 30, and are subject to the commitments that typically accompany the middle decades of many peoples' lives. Postgraduate research students have partners, children, mortgages, debt repayments, employment commitments, and aging parents Some have disabilities which preclude the possibility of studying fulltime. For many of these students, postgraduate research education is only an option if they are able to study off-campus or part-time. University policies which discourage part-time or external study exclude these students from the opportunity to undertake a research higher degree*[16].

However, there are significant disincentives to taking part-time candidature. Unlike full-time APA scholarships, part-time APA scholarships are considered taxable income. This not only reduces the level of income but also potentially affects other forms of social benefits. There are also often problems associated with a longer candidature (such as continuity of supervision) and part-time candidature can affect access to limited resources (such as office space, computers, etc) in some institutions. CAPA has also noted the connection between part-time studies and family responsibilities, and provides anecdotal evidence of the reluctance of some institutions to allow any variations to their full time candidature:

> *Student advisers at several postgraduate student associations have also noted that their universities seem to be increasingly reluctant to grant students suspension of candidature, leave of absence or conversion from full time to part time enrolment, due to concern that this may jeopardise the likelihood of a student completing their degree. However, flexibility in university policy is important to enable students with competing demands on their time, such as family responsibilities or the need to financially support themselves and their dependents, to continue their studies rather than be forced to withdraw from their degree.*[17]

With this in mind, NTEU supports the call by CAPA to amend the Commonwealth scholarship guidelines to allow greater flexibility for taking the APA part-time, thus providing stronger incentives on the part of the student to complete their studies in the relevant time.

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[15]. It should also be noted that in 2001, the RTS Conditions also reduced the duration of funding for a PhD candidate from 5 yrs to 4yrs; and for a Masters candidate from 3 years to 2 years.

[16] CAPA *Implementing the Research Training Scheme: The consequences for postgraduate research students ,* 2002, pg 25.

[17] ibid., pg 12

Table 12. 2008 APA Rates with Proposed APA Increase

	APA stipend rates		
	Full time	Part time	APAI
2008 rate	$ 20,007	$ 10,710	$ 26,140
+ 30%	$ 6,002	$ 3,213	$ 7,842
	$ 26,009	$ 13,923	$ 33,982

Source: CAPA, Media Release: *APAs to Break Poverty Line*, April 2008

2.6.3 Duration of APAs

Another long standing concern in relation to the APA's is the duration of the scholarship. Notwithstanding the emphasis placed on completion, DDOGs reports that the average completion time for a PhD is *over* 3.5 years. CHASS argues that this figure is higher in the humanities, arts and social science areas, currently at 4.48 years, about 2.5 months longer than for other disciplines[18].

However, the current funded period for a PhD scholarship is only three years (with a possible extension of up to 6 months). This arrangement can be counter productive as it leaves the majority of candidates short of funds at the most crucial time of their candidature.

Both DDOGs and CHASS have recommended that the funded period be extended to 3.5 years, with a further 6 months extension possible on academic grounds.

However, CAPA goes further, calling for a standard 4 years duration for all full-time APAs, a position that NTEU also supports on the basis that an increase to 4 years more accurately reflects the data on the average time taken to complete a PhD.

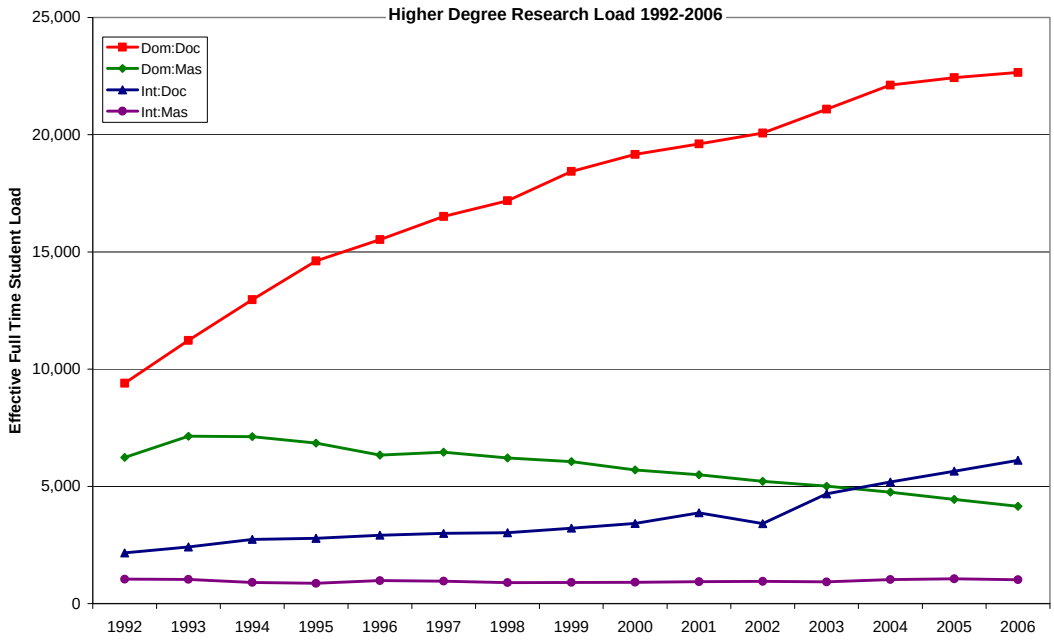
2.7 International Postgraduate Research Students

International postgraduate students provide Australia with a valuable opportunity to increase the pool of potential new researchers and develop further our breadth of knowledge and research expertise as well as forging possible international linkages in the future. International graduates made up 22% of Australia's Bachelor degree enrolments and 53% of Master's degree enrolments in 2006, but only 19% of PhD enrolments (see Chart 4).

While the demand for available international postgraduate places is strong, Australia's share of international PhD enrolments is well below that of major competitor countries, and there is some concern within the sector that we are not realising our potential in the international postgraduate research market. A comparative analysis between Australia and selected overseas countries shows our HDR enrolments to be significantly lower (see Chart 5).

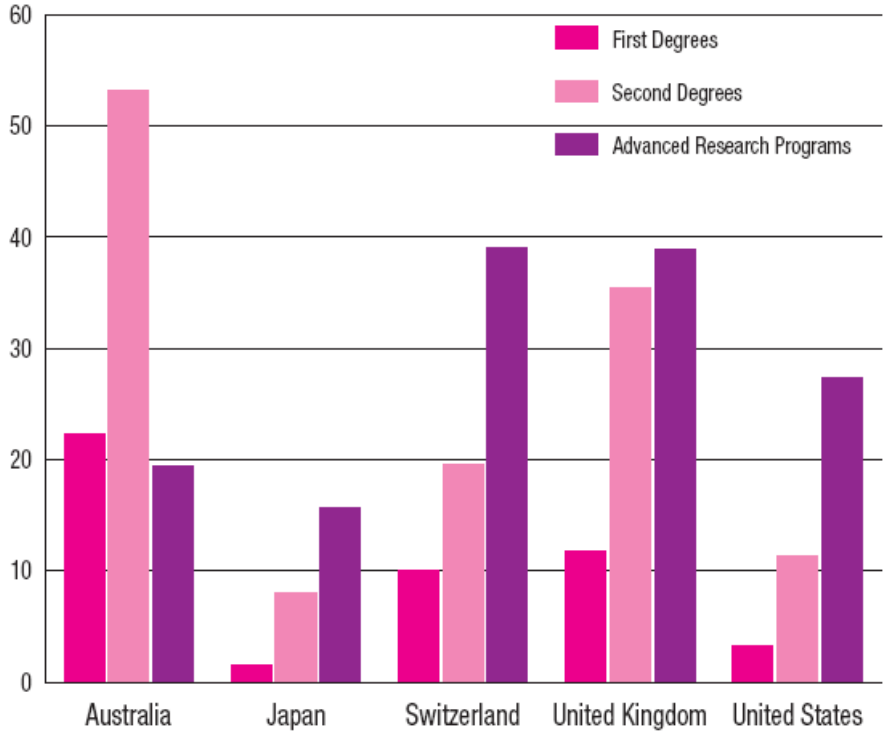
[18] Western & Lawson – derived from Report to DEST on HEIP Project (J5001): *PhD Graduates 5 to 7 Years Out: Employment Outcomes, Job Attributes and the Quality of Research Training.*

Chart 4: Higher Degree Research Load 1992 - 2006



Source: DEST, *Higher Education Student Statistics,* various years

Chart 5. Proportion of international graduates in total graduate output by level of award, for selected countries, 2005



Source: OECD *Education at a Glance* 2007

One of the major issues lies with the fact that Australian universities are competing against well funded scholarships offered by international universities, which are often far superior both in value and scope to what is offered by Australia.

The Group of Eight[19] reports that, from 2007 onwards there will be approximately 2,288 scholarships offered by the Australian Government for international students to undertake study in Australia at the postgraduate level. This figure is made up of:

- 1,150 Australian Development Scholarships (estimate based on 88% of 1320 total available)
- 180 Australian Leadership Awards – Scholarships (150 Masters, 30 PhD) (AusAid estimate for 2007).
- 370 Australian Leadership Awards – Fellowships
- 330 Endeavour International Postgraduate Research Scholarships (Precise number to be offered from 2007 onwards will be substantially less than this due to clawback for overspending under the program in 2004 and 2005)
- 40 Endeavour Postgraduate Awards (estimate only)
- 30 Endeavour Asia Awards (funding for first year only) (estimate only)
- 158 Endeavour Research Fellowships (four to six months only) (estimate only)
- 30 Endeavour Cheung Kong Awards (four to six months only) (estimate only)

These 2,281 scholarships represented 25% of international HDR students (8,981) in 2006. Universities also variously provide internal scholarships, and some overseas students come here under sponsorship of their home governments or other benefactors. Some two-thirds of international graduate students in the US obtain income support from their host university or college.

Funding for these scholarships varies considerably, largely dependent on the cost of tuition and whether the scholarship scheme allows for other expenses, such as living expenses and/or any social benefits schemes (for either the individual student and/or any dependents that may be with them, such as health insurance or school tuition). This situation makes it difficult to estimate the total cost of the combined international scholarship schemes at postgraduate level. However, whilst the costs of tuition and other related expenses have increased during this last 12 years, there have been very few increases in the number of international scholarships offered overall.

This fact is illustrated well by the Endeavour International Postgraduate Research Scholarship (EIPRS) scheme, which provides financial support to assist outstanding international candidates to complete higher degree by research qualifications in Australia. Although one of the major international scholarship programs, it has seen very limited increases in scholarship numbers over the last ten years. In 1996 there were 300 new scholarships per year available under this scheme. Over the last 12 years, there has been an annual increase of just 30 new places (announced in 2002), with the current level remaining at 330 new awards a year.

In real terms, however, it should be noted that 228 EIPRS places are offered annually, as each of the latter two programs provide financial support for one year and six months of study respectively (and thus have different timing).

Therefore, while numbers of international students undertaking postgraduate studies in Australia is four times higher than 1997 levels, the number of EIPRS scholarships and the comparative total funding pool has remained relatively constant.

[19] Group of Eight, op cit, pg 5

3. Research Graduate Outcomes

Whilst a PhD has traditionally been viewed primarily as a qualification for academic practice, evidence shows that increasingly it is being sought across a range of professional occupations, either as entry into a new career or advancement in an existing one.

At the same time, substantial changes to higher education and the manner in which research in the sector is conducted has seen the attraction of an academic career lessen. The Go8 *Background Paper on Research Training*[20] notes that: "*… researcher autonomy is perceived to be more constrained, regulatory compliance obligations are more exacting, administrative tasks are more burdensome, expectations of self-generated income are more demanding."*

As such, it is not surprising that the data for graduate outcomes shows that relatively few postgraduate students move into academia. According to data published by Graduate Careers Australia Postgraduate Destinations (2006), more than two thirds of PhD graduates in Australia are employed outside the university sector. Table 13 (below) shows that whilst education still has the highest proportion of HDR graduates, it accounts for just over a quarter of all graduates overall.

Table 13: Main occupations of Higher Degree by Research graduates in full-time employment, all fields of education, 2006

Occupation	HDR graduates (%)
Education professional	27.6
Science professional	23.2
Manager/Administrator	9.8
Business/Computing professional	7.7
Social/Legal professional	7.4
Health professional	7.3
Building & Engineering professional	5.2
Other Associate professional	2.0
Medical, Science Associate professional	1.7
Artist/Related professional	1.4
All Others	2.1
Total %	**100**

Source: Graduate Careers Australia (2006) *Postgraduate Destinations*, 2006.

Table 14 (below) breaks this data down further, providing a comparison between university and other destinations by subject field for HDR graduates.

[20] Group of Eight, op. cit, pg 3.

Table 14. Destination of Higher Degree by Research graduates in full-time employment, University compared to other Destinations

Field of Education	University destination (%)	Other destination (%)
Agriculture	6.8	93.2
Architecture	37.0	63.0
Humanities	33.0	67.0
Social Sciences	13.3	86.7
Psychology	23.0	77.0
Social Work	40.0	60.0
Accounting	50.0	50.0
Economics	35.0	65.0
Education	37.6	62.4
Electronic/Computing Engineering	12.5	87.5
Mechanical Engineering	13.0	87.0
Mining Engineering	11.1	88.9
Medicine	6.9	93.1
Pharmacy	11.1	88.9
Dentistry	11.1	88.9
Law	57.7	42.3
Mathematics	41.7	58.3
Physical Science	8.5	91.5
Geology	2.9	97.1
Computer Science	32.2	67.7
Veterinary Science	17.6	82.4
Total %	**27.6**	**72.4**

Source: Graduate Careers Australia (2006) *Postgraduate Destinations*, 2006.

This data shows clearly that the rate of HRD graduates entering academia is for the most part quite low; the only exception being for law HDR graduates.

The reasons for low entry into academia are varied, but potential income plays a major role. Research has shown that private returns to PhD graduates are lower than those for graduates with a Masters by coursework; with the median salary for Research Masters/PhD graduates in full-time employment in 2006 set at $60,900 compared with $65,000 for coursework Masters graduates. In addition, the time taken to complete a PhD (generally four years full-time equivalent, or longer) may involve a higher 'opportunity cost' than Coursework Masters, which are generally up to two years full-time equivalent.[21]

Earning levels for entry into academia may also compare relatively poorly to that offered by industry. In 2007, academic salaries for Academic Level A (Associate Lecturer) appointments ranged from $46,000 at the entry step to $62,900 at the top step. For Academic Level B (Lecturer) the range was from $66,200 to $78,500. Equivalent skills command much higher rates of remuneration in Government departments, publicly-funded agencies and professional service firms.

It should also be noted that the increase in casual and fixed term employment has corresponded with a decrease in permanent employment. As such, many HDR graduates are dissuaded from entering academia.

Finally, it should be noted that career options are uncertain for early and mid-career researchers. Employment is often on fixed term contracts or casual employment arrangements, which offer little security of employment and limited career opportunities. This situation is largely a result of the grant structure, which generally incorporates grants for short-term research projects, typically three

[21] Group of Eight, op. cit., pg 3

years in the case of ARC grants, three to four years for NHMRC grants, and even shorter grants for industry funded and contract research.

As such, the announcement by the Federal Government of new mid-career research scholarships is a welcome initiative. It would be useful to have a similar measure to encourage early career research academics, as existing post-doctoral places are quite limited in terms of availability and discipline area.

Too many talented researchers, who could form the base for the next generation of Australia's research capability, are being lost to the system. It is obvious that the attraction of young people to academic careers requires improvement to conditions of employment and a more effective marketing campaign to attract more graduates to university employment.

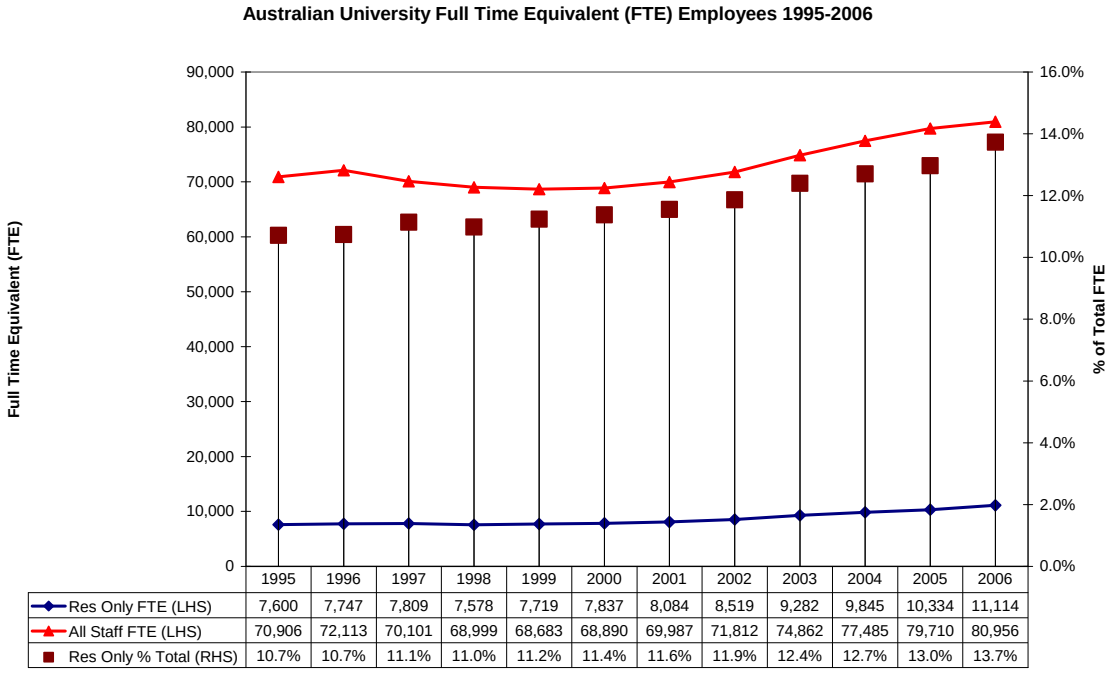
Part D

4. The Research Workforce in Higher Education

The data in Chart 6 shows full time equivalent (FTE) employees working at our universities from 1995 to 2006, FTE employees classified as research-only staff over the same period and the proportion of total FTE accounted for by research-only staff. In 2006 Australian universities employed a total of 80,956 FTE staff, an increase of 14.2% over 1995.

In 2006, 11,114 FTE staff were classified as research-only, representing an increase of 46.3% over 1995 levels. As a consequence, the proportion of total staff classified as research-only rose from 10.7% in 1995 to 13.7% in 2006.

Chart 6. Australian University Full Time Equivalent (FTE) Employees 1995 - 2006



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Res Only FTE (LHS)	7,600	7,747	7,809	7,578	7,719	7,837	8,084	8,519	9,282	9,845	10,334	11,114
All Staff FTE (LHS)	70,906	72,113	70,101	68,999	68,683	68,890	69,987	71,812	74,862	77,485	79,710	80,956
Res Only % Total (RHS)	10.7%	10.7%	11.1%	11.0%	11.2%	11.4%	11.6%	11.9%	12.4%	12.7%	13.0%	13.7%

Source: NTEU estimates derived DEWRR (DEST) *Higher Education Staffing Data* (www.dest.gov.au)

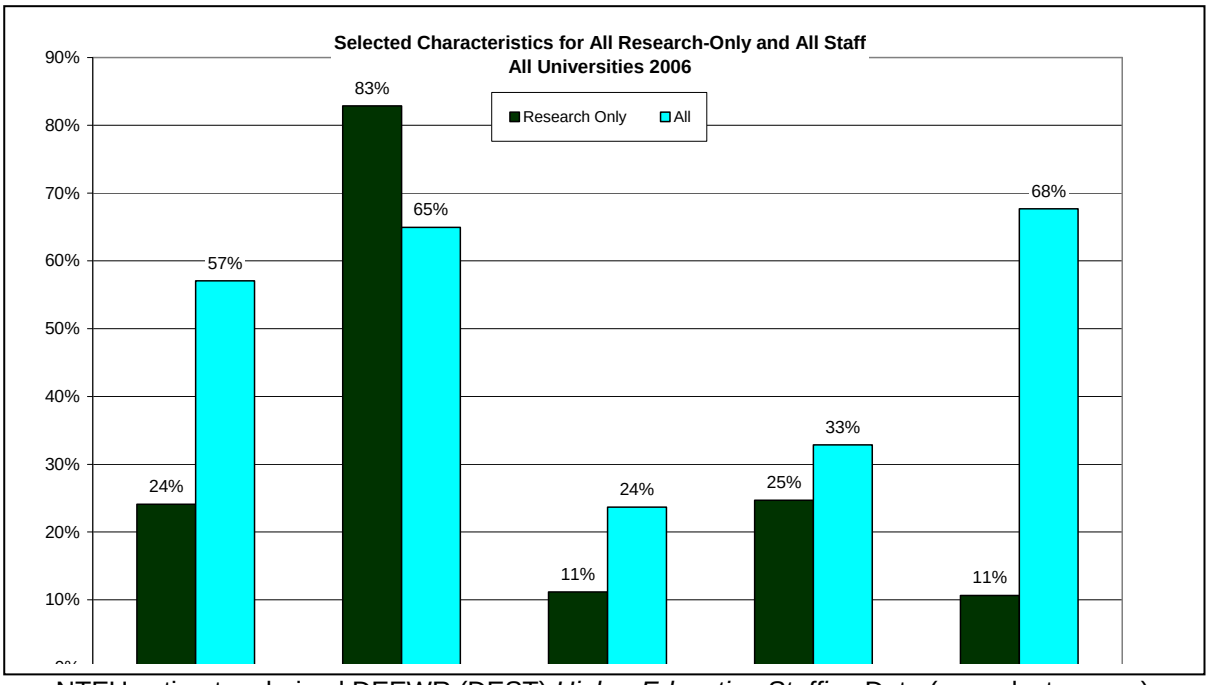
Chart 6 provides comparative data for full time and fractional staff (excluding casual staff), research-only staff and all staff in relation to percentage (%) of staff who in 2006 were:

- classified as general staff;
- under 50 years of age;
- appointed at Level D or above for academic staff or HEW7 or above for general staff; and
- have tenure or continuing employment.

Chart 7 shows that if you were employed as a research-only member of staff at an Australian university in 2006, compared to all university staff you were, on average:

- younger;
- more likely to be classified as an academic;
- more likely employed at a lower level than that either of academic or general staff; and
- be far less likely to have tenure (continuing employment).

Chart 7: Selected Characteristics for All Research-Only and All Staff, All Universities 2006



Source: NTEU estimates derived DEEWR (DEST) *Higher Education Staffing* Data (www.dest.gov.au)

A more detailed breakdown of the data by gender and academic and general staff is provided in Table 15.

Table 15: Comparison of Staff Characteristics for Research-Only and All Staff 2006			
Full Time Equivalent (FTE) Staff			
% of Staff classified as General		**Res Only**	**All Staff**
Male		17%	46%
Females		32%	67%
Persons		24%	57%
% of Staff Aged under 50		**Res Only**	**All**
Academic	Male	82%	57%
Academic	Female	84%	65%
General	Male	83%	60%
General	Female	81%	67%
All	Persons	83%	65%
% Staff by Level of Classification		**Res Only**	**All**
Academic	Male	15%	30%
Level D +	Female	5%	14%
	Total	11%	24%
General	Male	33%	42%
HEW 7 +	Female	20%	27%
	Total	25%	33%
% Staff who have Tenure (continuing employment)		**Res Only**	**All**
Academic	Male	10%	62%
Academic	Female	5%	57%
General	Male	29%	76%
General	Female	14%	72%
ALL	Persons	11%	68%

Source: DEST *Higher Education Staffing Statistics*, 2006

4.1 Security of Employment for Research Only Staff

The results in relation to age, classification and level of appointment are not of any great surprise, given that many research-only staff are likely be to higher degree research students or recent graduates. What is of concern is that the data shows that only about one in ten (11%) of research-only staff have continuing or secure employment. In other words, approximately 90% of research-only staff are employed on limited term contracts.

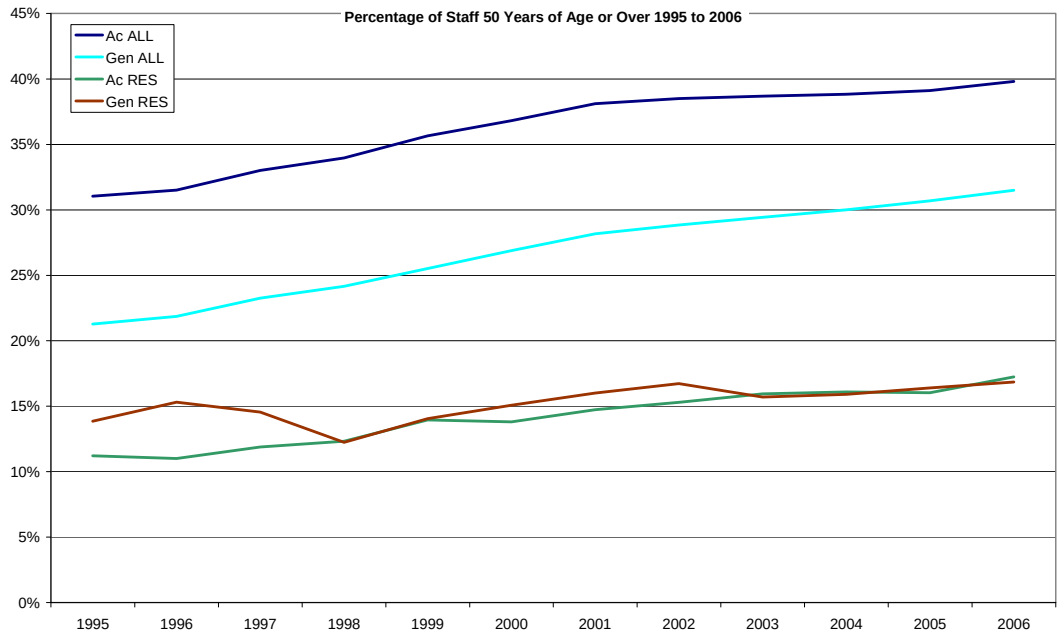
This situation is a major concern. The composition of the academic workforce is likely to change dramatically over the next decade, with many senior staff retiring from full time university employment. It is critical that Australian universities build their capacity to attract and retain new generations of academic researchers.

Insecure employment affects the ability of employees to secure loans (such as for housing) and to plan for their future. Depending on the nature and timing of the employment contract, research staff may not be able to access entitlements available to permanent university staff, such as maternity leave, long service leave and comparable superannuation benefits. Starting salaries for research scholars are comparatively low, and career paths are not as well defined. As such it is not surprising that many HDR graduates choose to pursue a career outside of universities

4.2 The Aging of the Academic Workforce

Chart 8 shows the percentage of university staff who were aged 50 years or above for the period of 1995 to 2006. The data is disaggregated between academic staff and general staff and for all employees and research only employees. When interpreted, the data highlights the ageing of the university workforce, especially amongst academic staff, where academics are on average considerably older than general staff. The ageing of the workforce is not unique to universities. Research by Professor Graham Hugo[22] indicates that in 2001 the academic workforce was, on average, older than the general workforce (see Table 16) and older than a number of other comparable professions. The implications of the ageing academic workforce are clear - in the next decade, a considerable number of the current academic workforce retire and will need to be replaced.

Chart 8. Percentage of Staff 50 Years of Age or Over 1995 - 2006



Source: DEST, *Higher Education Student Statistics,* various years

[22] Hugo, Graham, "Academia's Own Demographic Time-Bomb", *Australian Universities Review*, Vol 48, No.1, 2005, pp16-23

Table 16: Australia: Percentage of the Workforce by Age Groups, 2001

	All academics	Lecturers and tutors	All workforce	All professionals	IT Professionals
55 years and over	15.7%	19.0%	11.5%	11.1%	3.6%
45 years and over	44.5%	51.2%	33.4%	36.3%	18.7%
Under 40 years	40.8%	33.8%	53.8%	49.3%	67.7%

Source: Hugo (2005).

The data suggests that universities face significant challenges in the immediate future in terms of succession and continuity of their academic workforce with the expected retirement of older and experienced staff, in whom much of the stock of intellectual knowledge (intellectual infrastructure) currently resides. Therefore, it is essential that, if our universities are to maintain their intellectual infrastructure, they will need to employ, train and develop the next generation of academic and research staff while the older more experienced academics are still available to provide guidance and mentoring.

This raises the question of where the next generation of academic and researchers will come from. As Hugo observed, Australian universities face considerable challenges in recruiting new academic staff:

> *International competition for highly skilled professionals including academics has never been more competitive. Australia must compete not only for potential academic staff from other countries but also for Australian graduates who are increasingly examining options in foreign universities.*[23]

NTEU believes that fixed term research-only positions, such as Junior Research Fellows, should be considered to be an entry point for higher degree research graduates who aspire to pursue an academic career. However, one concern raised by the data presented in Chart 8 is that, while research-only academics remain considerably younger than all academic staff, they have been ageing at greater rate over the period 1995 to 2006, with the proportion of research-only academic staff aged 50 years and above having increased by 58% over the period, compared to 28% for academic staff. This may be an indication that research-only academic staff may not be moving into the academic (teaching and research) workforce more generally but are remaining in research-only positions for extended periods of time.

4.3 Concerns of Research Staff

A recent NTEU forum for research staff employed on fixed term or casual contracts of employment revealed a number of frustrations with their current employment arrangements, which included:

- Years of rolling fixed term contracts with no protection from arbitrary non-renewal;
- Arbitrary assignment of staff as academic or general – sometimes based on cost alone, or on the use of academic "status" to make up for poorly paid research-assistant work;
- Lack of career structure for contract research staff
- Lack of access to promotion for Research Fellows; or lack of clarity about the basis for classification or promotion of academic (Research Fellow) and general staff (Research Assistant);
- The perceived "disadvantage" of applying for promotion and therefore becoming more expensive to employ;

[23] *ibid*, p.21.

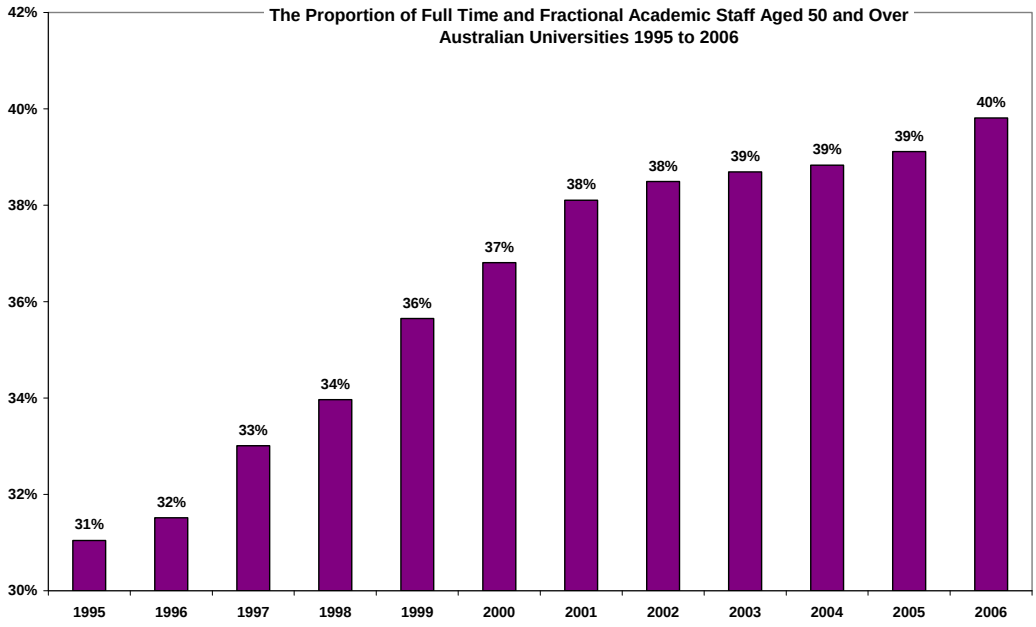
- Lack of opportunity for self-directed research and a lack of opportunity to undertake research leading to publication;
- Lack of teaching/career development opportunities for staff engaged on narrow research projects – especially where these projects are commercial or run by senior staff.;
- Loss of entitlements through breaks in service of more than the short periods allowed by Agreements – often 6 weeks. In particular, the discriminatory effect on those taking a year away from contract employment for child-birth and parental leave;
- Lack of access to superannuation entitlements and employer contribution rates at the same levels as continuing employees.

Part E

5. The Future of the Research and Academic Workforce

Evidence on graduate outcomes indicates that academic work has become less attractive than other occupations in terms of working conditions. In addition, statistical evidence shows Australian universities are faced with a rapidly aging academic workforce. As the data in Chart 9 shows 40% of the Australian full-time and fractional academic workforce was 50 or over in 2006. This has increased by almost 10 percentage points since 1995 and this rapid increase in older academics means that up to four in ten academics might be expected to retire over the next 15 years.

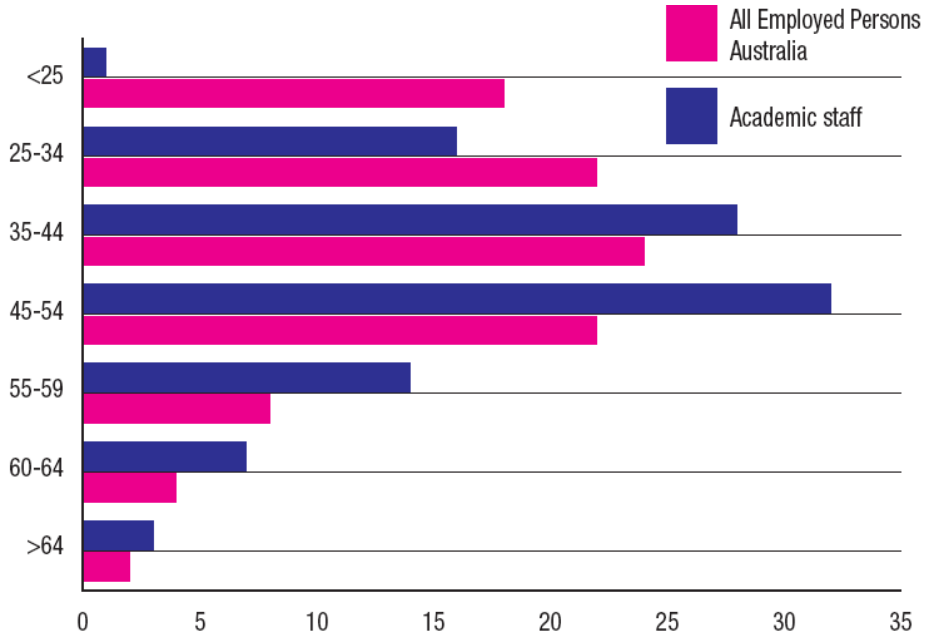
Chart 9: The Proportion of Full Time and Fractional Academic Staff Aged 50 and Over 1995 - 2006



Source: DEST, *Higher Education Staff Statistics,* various years

When compared to the employed workforce as a whole, the aging profile of Australia's academic staff becomes even more pronounced. The recent Group of Eight background paper on research training issues provides excellent analysis on the aging of the workforce (see Chart 10)

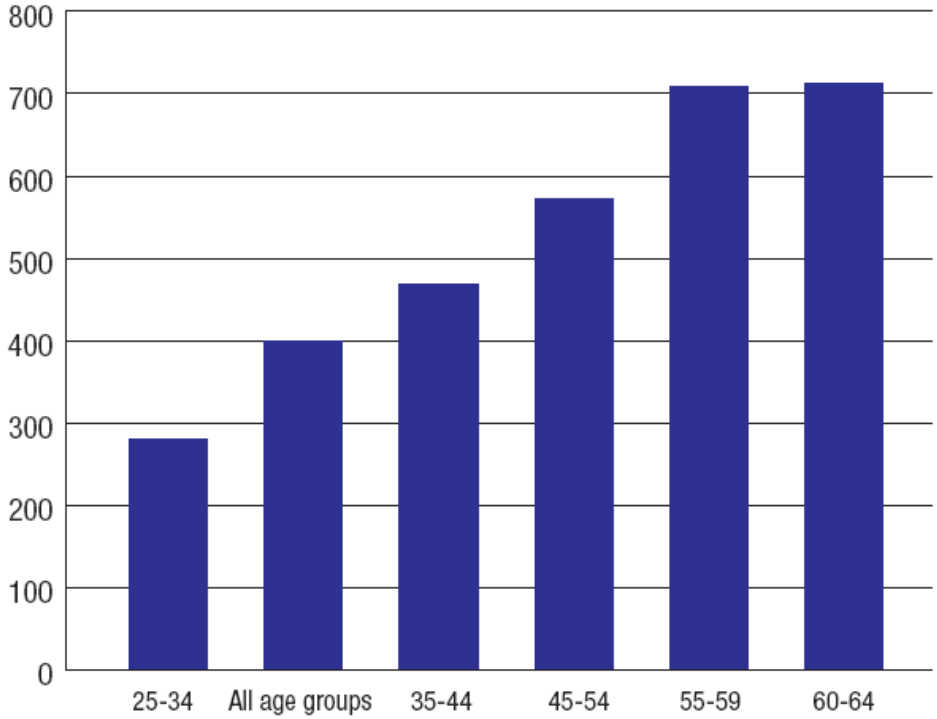
Chart 10.Age structure of total academic staff (2006) relative to all employed persons, Australia 2005-06



Source: Group of Eight Background Paper, *Researcher Supply and Demand - no 3*, 2007.

Chart 11 supports this data, illustrating that in the higher echelons of the age bracket, the numbers of university staff per 10,000 employed persons grew substantially to just over 700. In terms of percentage, this means that more than 7% of the total workforce of the age groups of 55 – 59 and 60 -64 are university employees, significantly higher than the average of 4% for all age groups.

Chart 11. Academic staff per 10,000 employed persons, by age, Australia 2006



Source: Group of Eight Background Paper, *Researcher Supply and Demand - no 3*, 2007.

The Group of Eight paper makes the assumption that, over the next decade, 25% of academic staff employed in universities in 2006 will leave the academic workforce for occupational mobility reasons, and that 85% of academic staff above the age of 55 years would retire. As such, the paper estimates the net academic workforce replacement requirement would be approximately 1,725 per annum over the period of 2006–2016.

The paper also estimates that while the current rate of domestic PhD production is approximately 4,250 per annum, this output flows from a commencing cohort in 2001 of 4,758, which was 5% higher than the 2006 commencing cohort. Thus, the paper argues the trajectory for PhD output is closer to 4,002 per year.

Another factor to consider is that the current data for graduate destinations shows 72.6% of HDR graduates (3,086 per annum) enter non-university occupations. Assuming that the majority of these graduates do not decide later to take up university positions and remain in their respective professions, and assuming there was no increase in general labour market demand for PhD graduates, the Group of Eight paper assumes that supply to the academic labour market would amount to 906 per year.

Therefore, in order to replace the current level of PhD qualified academics in the university workforce (which does not take account any future growth) there is a projected shortfall of 809 PhD graduates, which equates to an average of 47% per annum.

These issues indicate that Australian universities are likely to be faced with significant recruitment problems over the next decade. The Union is worried that if these issues are not addressed then our universities' capacity to fulfil their critical role as the primary source of much of R&D and as the educators of our next generation of academics and researchers might be severely compromised. Therefore as a matter of priority this review should also examine the following issues in relation to our universities' workforce:

- The effect that likely retirements of significant numbers of Australia's most highly qualified and experienced researchers will have on the stock of accumulated intellectual knowledge and know how (intellectual infrastructure) on our universities and the research and innovation system more generally; and
- Enhanced public and institutional policies to encourage university programs that support research staff development and renewal.

Professor Hugo has recommended a suite of programs that may assist in relation to innovative human resources strategies. NTEU supports these strategies, as listed below.

- Introduction and support of 'New blood' programmes;
- Early recognition of new talent;
- Family friendly policies;
- 'Bringing them back' programmes to repatriate former staff and students of the university;
- Developing joint international exchanges in teaching and research;
- Incentives to keep 'high flyers' in the university;
- Gradual retirement programs for selected staff; and
- Accelerated promotion for key staff. [24]

In addition Hugo suggests that the substantial increase in teaching loads that has occurred over the last decade may well have been possible because of the experience of the teaching staff over this period. He warns that large scale replacements of this expertise with recent graduates could present significant difficulties.[25] This is particularly significant for teaching and research staff who are already struggling to find time to undertake the research component of their work.

Clearly, if these trends continue then universities will be facing a potential recruitment crisis in the coming decades. NTEU believes it is imperative that this situation is addressed quickly and as a

[24] *ibid,* p.22.
[25] *ibid*, p.21

priority for both Government and the sector as a whole. The current demand for skilled graduates to the workforce will only worsen if the staff that teach these skills are themselves in short supply. Therefore, while it is important that programs for research training and support are examined and their associated problems addressed, the impediments and disincentives that prevent our research graduates from choosing a career in Australia's universities must also be eliminated.