

---

The Parliament of the Commonwealth of Australia

# Building Australia's Research Capacity

House of Representatives  
Standing Committee on Industry, Science and Innovation

December 2008  
Canberra

---

© Commonwealth of Australia 2008

ISBN 978-0-642-79132-0 (Print version)

ISBN 978-0-642-79133-7 (HTML version)



# Contents

Foreword .....	vi
Membership of the Committee .....	viii
Terms of reference .....	x
List of abbreviations and acronyms .....	xi
List of recommendations .....	xvi
<b>1 Introduction .....</b>	<b>1</b>
Policy reviews .....	1
Background to the inquiry .....	2
Structure of the report .....	3
<b>2 The role of education in promoting Australia’s research capacity .....</b>	<b>5</b>
Introduction .....	5
Developing an interest in research: primary and secondary education .....	6
Curriculum .....	6
Quality of teaching and infrastructure .....	8
Equity .....	10
Exposure to researchers .....	11
Developing an interest in research: tertiary education .....	12
Undergraduate education .....	12
Honours .....	13
<b>3 Research funding .....</b>	<b>17</b>
National Research and Development funding .....	17
Universities and funding for research training .....	21

---

Government support for research training.....	21
Research Training Scheme.....	23
Increasing student diversity.....	53
Areas of skill shortage.....	56
<b>National competitive grant funding for research .....</b>	<b>59</b>
Australian Research Council.....	60
National Health and Medical Research Council .....	60
Success rates.....	61
Full cost of research.....	63
<b>4 Funding and support for research students .....</b>	<b>67</b>
<b>Period of PhD candidature .....</b>	<b>67</b>
<b>Scholarships and awards.....</b>	<b>71</b>
The Australian Postgraduate Award.....	71
Number .....	72
Duration .....	72
Value.....	76
Indexation .....	78
Post-submission candidature .....	79
<b>Additional income support.....</b>	<b>82</b>
<b>5 Attracting students to research training.....</b>	<b>87</b>
Financial considerations .....	87
Flexibility of study arrangements .....	90
Equity.....	93
Eligibility .....	93
Regional universities .....	94
Under-represented groups .....	95
<b>International postgraduate research students .....</b>	<b>97</b>
Scholarships .....	98
Visa arrangements.....	102
<b>6 Research Careers.....</b>	<b>105</b>
The value of research careers in Australia .....	105

---

<b>Career pathways in academia</b> .....	<b>109</b>
Limited entry-level research positions .....	109
Declining job security and stability .....	112
Academic salary structures .....	114
<b>Research career pathways in industry</b> .....	<b>116</b>
Centres of Excellence and research networks .....	117
Women and research careers .....	118
<b>Attracting international and expatriate researchers to Australia</b> .....	<b>120</b>
Ageing academic workforce.....	122
<b>Appendix A – List of submissions</b> .....	<b>129</b>
<b>Appendix B – List of exhibits</b> .....	<b>135</b>
<b>Appendix C – List of public hearings</b> .....	<b>139</b>



## Foreword

When the Committee embarked upon an inquiry into research training and research workforce issues in Australian universities, it quickly became apparent that the challenges we face in boosting Australia's research training capacity are not simply confined to academia.

Equally compelling in the submissions received by the Committee in response to this inquiry, was the broadly shared recognition that many of the challenges we currently face in boosting our research capacity are in large part the result of years of neglect for research training in Australia, making the task of addressing these challenges all the more urgent.

The value of research and innovation in today's 'knowledge economy' cannot be overestimated. Australia's research reputation was once well-recognised and admired around the world. Unfortunately, instead of investing further in research training, we have rested on our laurels while the international research landscape has continued to change and develop. Australia's research climate has been allowed to lag behind world standards such that we now face severe challenges in bolstering our capacity for research and innovation.

Three key issues surfaced time and again during the course of the inquiry, especially as the Committee conducted public hearings around Australia.

First, there was unanimous agreement that the path to research begins not at university but at school, as early as the primary or secondary years. The challenges of recruiting and training researchers cannot be addressed fully at the tertiary level. To be timely and effective, Australia's strategy to improve research competitiveness must address fundamental factors that prepare potential researchers, such as a comprehensive curriculum, high-quality teaching and adequate infrastructure in Australian schools.

The current declining interest in, and standard of foundational subjects like maths, sciences, history and languages, is leading to both a shortage of teachers who are suitably-qualified in those areas to teach future generations of schoolchildren, and a decrease in the standard of tertiary-ready students. If students enter university without an adequate educational grounding, skills and knowledge, the task of inspiring and attracting them to consider further higher education is made even more difficult.

Second, there needs to be greater collaboration between universities and research institutes, schools and industry more broadly. Research training is not the sole purview of academia, nor is academia the sole beneficiary of research training. Research is of value to society as a whole, be it in academia, government, or small and large businesses.

In Australia, we still do not hold research and researchers in high esteem, despite the significant contribution they make to the nation. The low status of research careers is evidenced by continuing low levels of national investment, social recognition and relative remuneration.

Third, and perhaps most important, inadequate funding for research training and research careers remains the fundamental obstacle to building Australia's full research capacity. Under-funding of research across the spectrum is reducing Australia's international competitiveness in the areas of research and innovation.


The full cost of research training, whether it is provided by a university or a research institute, needs to be funded if Australia is to have healthy and dynamic research programs. Universities and institutes cannot provide a high standard of resources or outcomes with over-stretched budgets. Yet proper research training requires high-quality supervision, adequate infrastructure or the ability to access adequate infrastructure, and national and international collaborative research opportunities.

Moreover, just as in primary and secondary schools, Australian universities must retain their research and teaching staff to train Australia's next generation of researchers. Chronic under-funding has led to increased casualisation in the academic workforce, an over-reliance on short-term grants, and low salary scales relative to industry. The challenges in attracting and retaining academic staff at universities are exacerbated by the looming retirement of a significant section of the current academic workforce.

The cost to researchers-in-training also needs to be funded properly to mitigate the disincentives and difficulties associated with pursuing research study. Put simply, the current value of the PhD stipend for research students is nowhere near adequate. The supply of potential researchers is shrinking at the same time that international demand is growing, and Australia needs to invest heavily in attracting, training and retaining high-quality students.

This report conveys the inadequacy of current research training schemes to maintain Australia's research and innovation capacity. The recommendations contained herein, if implemented, will help ensure that Australia is building its national research capacity to the level required to support future growth.

**Maria Vamvakinou MP**  
Chair



## Membership of the Committee

Chair Ms Maria Vamvakinou MP

Deputy Chair Hon Fran Bailey MP

Members Mr James Bidgood MP

Mr Michael Johnson MP

Mr Nick Champion MP

Mr Rowan Ramsey MP

Mr Darren Cheeseman MP

Ms Amanda Rishworth MP

Dr Dennis Jensen MP

Mr Mike Symon MP



## Committee Secretariat

Secretary	Mr Russell Chafer
Inquiry Secretary	Mr Anthony Overs
Research Officer	Ms Natalya Wells
Administrative Officers	Ms Naomi Swann
	Mr Angus Hogg



## Terms of reference

The Inquiry will examine:

1. The contribution that Australian universities make to research training in Australia, including:
  - a) The contribution of research training programs to Australia's competitiveness in the areas of science, research and innovation;
  - b) The effectiveness of current Commonwealth research training schemes; and
  - c) The adequacy of current research training schemes to support Australia's anticipated future requirements for tertiary-qualified professionals in a wide range of disciplines.
2. The challenges Australian universities face in training, recruiting and retaining high quality research graduates and staff, including, but not limited to:
  - a) Adequacy of training and support (including income support) available to research graduate students in Australia;
  - b) Factors for graduates that determine pursuit of a career in research;
  - c) Opportunities for career advancement for research graduates and staff;
  - d) Factors determining pursuit of research opportunities overseas;
  - e) Australia's ability to compete internationally for high quality researchers; and
  - f) Whether Australia's academic workforce is ageing, and the impact this may have on Australia's research capacity.



## List of abbreviations and acronyms

AAH	Australian Academy of the Humanities
AARE	Australian Association of Research in Education
AAS	Australian Academy of Science
AATSE	Australian Academy of Technological Sciences and Engineering
ACDA	Australian Council of Deans of Agriculture
ACDE	Australian Council of Deans of Education
ACDS	Australian Council of Deans of Science
ACED	Australian Council of Engineering Deans
ACU	Australian Catholic University
ADBED	Australian Deans of Built Environment and Design
Adelaide	Adelaide University
AEU	Australian Education Union
AINSE	Australian Institute of Nuclear Science and Engineering
ANSTO	Australian Nuclear Science and Technology Organisation
APA	Australian Postgraduate Award
APAI	Australian Postgraduate Award (Industry)
ARC	Australian Research Council
ARCCE	Australian Research Council College of Experts

ASM	Australian Society for Microbiology
ATN	Australian Technology Network
ATSE	Australian Academy of Technological Sciences and Engineering
AUQA	Australian Universities Quality Agency
Batchelor	The Batchelor Institute of Indigenous Tertiary Education
CAPA	Council of Australian Postgraduate Associations
CDNM (ANZ)	Council of Deans of Nursing and Midwifery (Australia and New Zealand)
CHASS	Council for Humanities, Arts and Social Sciences
COAG	Council of Australian Governments
CPI	Consumer Price Index
CRC	Cooperative Research Centre
CRCA	Cooperative Research Centres Association
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSU	Charles Sturt University
CTS	Commercialisation Training Scheme
CUT	Curtin University of Technology
DDoGS	Council of Deans and Directors of Graduate Studies
Deakin	Deakin University
DIISR	Department of Innovation, Industry, Science and Research
ECU	Edith Cowan University
EIF	Education Investment Fund
EU	European Union
FASTS	Federation of Australian Scientific and Technological Societies

---

Flinders	Flinders University
FBT	Fringe Benefits Tax
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
Griffith	Griffith University
HASS	Humanities, Arts and Social Sciences
HDR	Higher Degree by Research
HECS-HELP	Higher Education Contribution Scheme- Higher Education Loans Programme
HEP	Higher Education Provider
IPRA-TICHR	Institute Postdoctoral Researchers' Association at the Telethon Institute for Child Health Research
IGS	Institutional Grants Scheme
IPRS	International Postgraduate Research Scholarship
IRUA	Innovative Research Universities Australia
JCU	James Cook University
KTP	Knowledge Transfer Partnership
La Trobe	La Trobe University
LOTE	Language Other Than English
MDANZ	Medical Deans Australia and New Zealand
Monash	Monash University
MUPRA	Macquarie University Postgraduate Representative Association
Murdoch	Murdoch University
NCGP	National Competitive Grants Program
NCRIS	National Collaborative Research Infrastructure Strategy

NHMRC	National Health & Medical Research Council
NTEU	National Tertiary Education Union
NTEU- CQU	National Tertiary Education Union (Central Queensland University Branch)
NTEU- UQ	National Tertiary Education Union (University of Queensland Branch)
OECD	Organisation for Economic Co-operation and Development
PFRA	Publicly Funded Research Organisation
PSP	Personnel Support Package
QUT	Queensland University of Technology
R&D	Research and Development
RHD	Research Higher Degree
RIBG	Research Infrastructure Block Grant Scheme
RMIT	RMIT University
RPS	Regional Protection Scheme
RSPSE- ANU	Research School of Physical Sciences and Engineering at Australian National University
RTS	Research Training Scheme
SCU	Southern Cross University
SORTI	Members of the Centre for the Study of Research Training & Impact
STEM	Science, Technology, Engineering and Mathematics
SUPRA	Sydney University Postgraduate Representative Association
SUT	Swinburne University of Technology
UND	University of Notre Dame
UniMelb	University of Melbourne

UniSA	University of South Australia
UNSW	University of New South Wales
UOW	University of Wollongong
UQ	University of Queensland
USC	University of the Sunshine Coast
USQ	University of Southern Queensland
USyd	University of Sydney
UWA	University of Western Australia
UWS	University of Western Sydney
VET	Vocational Education and Training
VU	Victoria University
WEHIMR	Walter and Eliza Hall Institute of Medical Research



## List of recommendations

### 2 The role of education in promoting Australia's research capacity

#### Recommendation 1

The Committee recommends that the quality of teaching and infrastructure at Australian primary and secondary schools be improved, particularly in the fields of maths and sciences. The Committee further recommends that the Australian Government and COAG investigate innovative measures taken overseas to address this particular concern.

### 3 Research funding

#### Recommendation 2

The Committee recommends that the Australian Government increase funding for research and development by raising incrementally the Gross Expenditure on Research and Development as a percentage of Gross Domestic Product over a ten year period until it equals the Organisation for Economic Cooperation and Development average.

#### Recommendation 3

The Committee recommends that the Australian Government determine and fund the number of Research Training Scheme places that will be required to meet current and future research training needs.

#### Recommendation 4

The Committee recommends that the Australian Government fund the full cost of each higher degree by research program at Australian universities through the Research Training Scheme and within all national competitive grant funding programs. This funding should take into account:



- the removal of the high-cost/low-cost funding differential that currently exists between research disciplines, subject to interim arrangements to ensure that no discipline is disadvantaged;
- the travel and accommodation needs of students for research collaboration, regardless of geographic location; and
- the provision and maintenance of a minimum standard of supervision and resources.

#### Recommendation 5

The Committee recommends that the Australian Government amend the current indexation measures for research training block grant schemes, to reflect real costs.

#### Recommendation 6

The Committee recommends that research training funding be disbursed, partially prospectively, to institutions according to a staggered formula: 50 per cent on enrolment, 20 per cent at a specified benchmark during the course of study, and 30 per cent at the point at which the student is informed that they have been awarded their degree.

#### Recommendation 7

The Committee recommends that the Australian Government retain the Commercialisation Training Scheme, currently in place until 2011, and evaluate the effectiveness of the scheme during the latter part of that period, with a view to extending the scheme.

#### Recommendation 8

The Committee recommends that the Australian Government develop and implement additional industry partnership programs, possibly modelled on Knowledge Transfer Partnerships, that will further facilitate connection between business and research institutions.

#### Recommendation 9

The Committee recommends that the Australian Government attach additional funds to research training scheme places that are secured by minority and under-represented students. This funding is for universities to provide the additional necessary assistance for minority and under-represented students throughout their candidature.

#### Recommendation 10

The Committee recommends that the Australian Government introduce a National Priority Postgraduate Research Scholarship Scheme that

provides competitive stipends to outstanding students in areas of national significance and skills shortage.

**Recommendation 11**

The Committee recommends that the Australian Government increase the funding pool for Australian Research Council and National Health and Medical Research Council grants to enable a minimum success rate for applicants of 40 per cent.

**Recommendation 12**

The Committee recommends that the Australian Government specify that competitive grants, in particular all National Health and Medical Research Council grants, fund the full cost of research in each program to which a grant has been awarded.

**4 Funding and support for research students**

**Recommendation 13**

The Committee recommends that the Australian Research Training Scheme PhD candidature period include the option of a six-month extension.

**Recommendation 14**

The Committee recommends that the duration of all federal postgraduate awards with stipends for PhD students be increased to three and a half years (full-time equivalent) with the option of two six-month extensions.

**Recommendation 15**

The Committee recommends that the Australian Postgraduate Award stipend value be increased by 50 per cent.

**Recommendation 16**

The Committee recommends that the APA stipend be fully indexed with CPI.

**Recommendation 17**

The Committee recommends that the Australian PhD candidature period be nominally extended beyond thesis submission until the time at which the student is informed that they will be awarded their degree.

**Recommendation 18**

The Committee recommends that access to Youth Allowance, Austudy or Abstudy be extended to all students enrolled in a higher degree by research, noting that:

- 
- access to those schemes does not determine eligibility;
  - candidates in receipt of a scholarship or other source of income above a determined assessment threshold would be ineligible; and
  - access to those schemes should be regarded as secondary to access to a scholarship or award with an adequate living stipend.

#### Recommendation 19

The Committee recommends that the Australian Government work with State Governments to support postgraduate students through the reduction of certain living expenses, in particular, through the provision of concessions for public transport travel. Access to transport concessions should be made available to all full-time tertiary students, regardless of type of enrolment or the level of course in which they are enrolled.

## 5 Attracting students to research training

#### Recommendation 20

The Committee recommends that postgraduate research scholarships be exempt from assessable income for taxation, including part-time awards.

#### Recommendation 21

The Committee recommends a full remission of the HECS-HELP debt for successful research PhD graduates and a partial (50 per cent) remission for successful research Masters graduates, awarded upon conferral, and a tax deduction for successful research graduates who have already paid their HECS-HELP fees.

#### Recommendation 22

The Committee recommends that the Research Training Scheme guidelines be amended to enable higher degree by research students to enrol jointly at two institutions, with student load and completion credited to both institutions.

#### Recommendation 23

The Committee recommends that the Commonwealth Scholarship Guidelines be amended to give award recipients greater flexibility in undertaking all or part of a higher degree by research on a part-time basis.

**Recommendation 24**

The Committee recommends a review of the ranking criteria for Research Training Scheme places and Australian Postgraduate Awards for greater consistency and to account for diverse backgrounds and entry points.

**Recommendation 25**

The Committee recommends that the Australian Government introduce a scheme to fund relocation costs for students who choose to undertake research training in regional universities.

**Recommendation 26**

The Committee recommends that the Australian Government develop and implement appropriate measures to encourage the recruitment of Indigenous, regional and rural Australians to higher degrees by research.

**Recommendation 27**

The Committee recommends a doubling in the annual number of IPRS awards to accommodate a greater number of international students.

**Recommendation 28**

The Committee further recommends that the value of the IPRS be increased to fully fund the tuition fees for each course of study.

**Recommendation 29**

The Committee recommends that Endeavour international postgraduate scholarships be rationalised and simplified for greater accessibility and competitiveness.

**Recommendation 30**

The Committee recommends that international student visa policies relating to higher degree by research programs be amended to allow greater flexibility for further research and employment.

**Recommendation 31**

The Committee recommends that the Australian Government work with the States to ensure that the dependents of all international higher degree by research students enrolled at Australian universities are subject to the same fee levels as local students at government primary and secondary schools.

---

## 6 Research Careers

### Recommendation 32

The Committee recommends that the Australian Government waive Fringe Benefits Tax incurred by businesses or institutions that employ staff undertaking higher degrees by research.

### Recommendation 33

The Committee recommends that the Australian Government, in conjunction with universities and research institutes, follow the example of successful advocacy programs overseas and implement a national research career campaign to market the value of research training to schools, communities and industry, and raise the profile of research careers in Australia.

### Recommendation 34

The Committee recommends that the Australian Government implement a postdoctoral fellowship scheme targeted at early-career researchers who are up to five years out from PhD completion.

### Recommendation 35

The Committee recommends that the Australian Government implement a quota of 10 per cent of ARC and NHMRC successful grants to be allocated to early-career researchers who are first-time awardees.

### Recommendation 36

The Committee recommends that the Australian Government implement a scheme that funds 25 per cent of the first two years of salary of postdoctoral researchers in industry areas of national skills priorities in order to promote the value of research graduates to industry.

### Recommendation 37

The Committee recommends that research Centres of Excellence schemes, such as the ARC Centres of Excellence, and other research networks be expanded to continue stimulating research and industry links in areas of national importance across Australia.

### Recommendation 38

The Committee recommends an expansion of fellowship schemes targeted specifically at expatriate and international researchers that offer competitive salaries and sufficient start-up support to establish research projects prior to competing for national competitive grants.

