

# ANU: 'university with a difference'

The Report of the Committee established  
by the Council of The Australian National University  
to evaluate the quality of ANU performance.

SEPTEMBER 2004

# **ANU: “university with a difference”**

The Report of the Committee established  
by the Council of The Australian National University  
to evaluate the quality of the University’s performance

September 2004

Report received and accepted by ANU Council at its meeting of the  
24<sup>th</sup> of September 2004

## ***Foreword: 'Quality Performance'***


*"The ANU began as a university unique in Australia and the world, and - after fifty years - so it remains."<sup>1</sup>*

This Review provides a critical assessment of the quality of research and educational outcomes of Australian National University at 2004. It recognises the utility of traditional institutional quality audits, which assess the means by which a university establishes its strategic goals and the means by which it measures its success in achieving those self-determined goals. But here our focus is on the outcomes measured against international comparators of like research-led universities. We here emphasise analysis centred on peer review applied to knowledge outcomes; and on peer perspectives, concerning the overall shape, character and future of the university. This 'performance review' aims therefore to address three audiences: the national policy environment in which ANU operates, with major implications for its funding; the international community, especially of this region of the world, in which the university faces great challenges and opportunities; and finally, the community of scholars and students, advisors and stakeholders who constitute ANU, and who must work to secure its destiny at a time of global transformations in education.

Using the definition of The Australian Oxford Dictionary - in which quality is ascribed the function of marking out an attribute or grade of excellence, and performance as the manner in which an entity fulfils its purposes - this Review asks how well does ANU perform alongside the major research-intensive universities of the world. It also goes further, and draws from our experience as senior educational leaders considering scenarios of the future concerned with challenge and opportunity for ANU.

Universities globally are reviewing not only their levels of performance in a highly competitive environment of higher education and research, but also attempting to chart new directions in the light of new knowledge formations and social expectations of these institutions.

We commend the Council of ANU for initiating such a review. In response to the Terms of Reference we have considered both history (performance) and prospect (strategic opportunities). While limitations of time prevented us from addressing some areas of importance, nevertheless we trust our input will provide a robust document for debate and decision with the University.

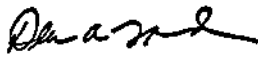


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Professor Deryck Schreuder  
(Chair)

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<sup>1</sup> S.G. Foster, & M.M. Varghese, (1996), *The Making of the Australian National University*. Allen & Unwin. Sydney.



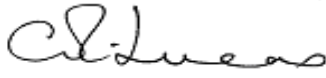
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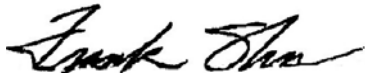
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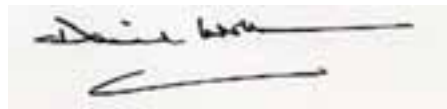
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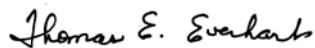
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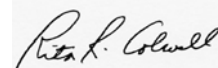
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Sir David Williams  
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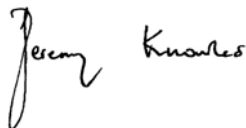
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## ***Executive Summary***

*Universities are a public trust which has to be earned anew by each generation...their social legitimacy depends not on what they have achieved, but on what they are becoming.<sup>2</sup>*

### **Distinctive characteristics of ANU**

ANU was established in 1946 by legislation of the Australian Parliament. Along with other national institutions in Australia's Federation, ANU was envisaged to be of enduring significance in the life of the nation – to support the development of national unity and identity, to improve Australia's understanding of itself and its neighbours, and to contribute to economic development and social cohesion.

ANU is distinctive among Australian universities in its research intensity, the relatively small scale of its undergraduate enrolments, its national capital location, its special mission for contributing to nation building and advancing Australia's place in the world, and the block funding it receives directly from the Australian Government for the Institute of Advanced Studies (IAS).

ANU has evolved into a research and teaching university, with national hubs and international networks of scholarly activity and outreach services. It has played no small part in the transformation of Australian higher education over the past decades. Our review set out to evaluate how well ANU is doing, and what it might best do, or do differently, to fulfil its mission in the challenging years ahead.

### **Findings**

The Review Committee had access to extensive data sets, including results of surveys undertaken specifically for the review. On the basis of all the available evidence and our own observations, we confirm the standing of ANU within the elite "Top 100" research-intensive universities of the world, even among the top 50 or so. In respect of research, our findings are similar to those of the Committee that reviewed the IAS in 1995: *research "is of a high quality overall in all the research schools and centres. Some groups are at the forefront of international research and among the leading groups in their field".* We make the additional point that the Faculties, too, are performing at high levels of quality.

For the purposes of our review, around 90% of ANU academic staff submitted their best five research works over the period 1995-2004 for assessment by some 285 external, mostly international peers chosen by the University (the names of assessors are listed at Appendix 4 of *ANU Capabilities and Performance Statement*). The assessors rated 67.8% of the University's research output submitted for assessment as being in the top 25% of research internationally and 29.2% of it in the top 5% internationally. For the

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<sup>2</sup> Harold. T. Shapiro, (2001), "Professional Education and the Soul of the American Research University", Ann Arbor, Michigan.

IAS, the respective figures were 73.4% and 35.0%; for the Faculties, 61.4% and 20.9%; for the University Centres, 60.8% and 24.4%. More than 40% of assessors rated ANU as being in the top 25 universities in their field in the world. The available bibliometric data reinforce the peer assessments. ANU is distinguished by the high volume of its high quality research output, especially in the natural sciences.

As a community of scholars, researchers and teachers, ANU offers an exceptional environment for undergraduate and postgraduate education. At their best, programs within the university present an ideal of the teaching-research nexus, with students benefiting from exposure to the scholarship of enquiry and discovery.

ANU has a considerable capacity for quality research training. The University makes important contributions nationally and internationally through its outreach services. Nevertheless, these aspects of ANU activities need further development.

The University faces critical challenges originating from changes in its external operating environment, including new types and levels of demand for higher education, increasing competition for resources, and changing public policy settings. It is vital that the University address its various challenges effectively, and in creative ways, in order to sustain the quality of its performance in an ever more demanding environment. The Australian Government, which established ANU, also has a particular responsibility in enabling the University to achieve its mission and maintain and strengthen its international status.

## **Recommendations**

Our recommendations accordingly are framed with a view to encouraging continuing discussion within the ANU community, and dialogue between the University and external communities, about the best ways to realise the University's full potential to meet national needs and to engage in global scholarship.

We make recommendations in relation to the following main issues:

- re-affirming the mission of the "national" university;
- indicating the major directions of the University's future development;
- continuing the reform of the University's internal structures towards greater internal synergies;
- the need for greater utilisation of distinctive capabilities of ANU;
- the critical importance of the block grant in conjunction with significantly greater income diversification;
- the further "engagement" of the University with external communities, both national and international.

Our recommendations are detailed below.

## **Reaffirming the mission of ANU**

In the uncertain times ahead, the University needs to be clear about its central role and purpose, the values it stands for and the performance standards expected of it. Recognition should be given to the substantial public benefits that flow from the collaborative international involvement of Australian researchers at the forefront of knowledge, to an extent that would not be possible for Australia to generate by itself.

*1. We recommend that the ANU Council reaffirms the special mission of the University in contributing to national, regional and local development through research, education and service of the best international standards. [see pages 1-3]*

## **Reaffirming the ANU vision**

To be a serious player on the international stage in the first part of the Twenty-First Century requires altogether more exacting capabilities than were required in the last half of the Twentieth Century. In the emerging global knowledge society, research-led universities need to be flexibly organised and internationally networked, and internally integrated by a culture of curiosity. They must also be adequately resourced to attract the best staff and the best students, and to access the highest quality infrastructure.

*2. We recommend that the ANU Council renews its commitment to the far-reaching vision for the University that includes:*

- *extending and deepening its engagement with external communities in Australia and internationally, especially in the Asia-Pacific region;*
- *expanding the use of its capacity for excellent research training;*
- *developing distinctive research-led undergraduate education, professional development and graduate education; and*
- *thereby, enriching the University academically and helping to build the resources it will require to sustain excellence. [see pages 43-46; 52-56].*

## **Engaging with external communities**

Modern universities have responsibilities to make constructive civic contributions. ANU does so contribute, but it is not as visibly connected as it needs to be, within Australia and elsewhere, to make the impact that it can make and to sustain the support that it requires.

*3. We recommend that the University gives attention to strengthening its ties nationally and internationally by:*

- *building further strategic alliances through research projects and inter-institutional partnerships, within Australia and beyond;*
- *increasing its networks of contacts in business and commerce which can lead on to research support and collaborations;*
- *forging tighter links with other national institutions;*
- *ensuring that all Faculties, Schools and Centres have the benefit of external advisory groups or boards, with special knowledge of their particular areas of expertise;*

- *deliberately reaching outside Canberra and the ACT to create associations (such as NICTA) which advance the mission of the University, and increase awareness of its role and achievements;*
- *making a major commitment to systematic development and fund raising based in the long-term commitment of "friend raising": ensuring that students as alumni remain associated with their university, finding benefactors who share the ANU vision, and harnessing the whole institution (starting with the Council) in building the endowment. [see pages 69-78].*

### **Research-led undergraduate education**

ANU is structurally advantaged to offer quality research-led education that cannot be replicated by any other Australian university. We envisage it offering distinctive programs like the PhB and direct-entry Masters, and combinations of programs, like double-degrees, that would attract the best students from across Australia, and the Asia-Pacific rim. We see ANU students having an intensive campus experience, in a residential setting at least in the first year, and having the opportunity to study with an ANU international partner at some stage in their learning.

*4. We recommend that ANU aspires to be an academically elite (residential) university, of up to 6000 undergraduate students, each student ideally having an intensive education integrated with research; and embedded in work experience, through an in-service course or internship, and which develops graduates for global citizenship through international experience. [see pages 52-55;71-72].*

### **Increasing the utilisation of research training capacity**

The role of the ANU in research training has been growing since the 1995 Review of the Institute of Advanced Studies. Nonetheless, across the ANU there is, on average, only one higher degree research student per research-active academic staff member – the same average ratio for all Australian universities. In some of the strongest research areas student numbers are inexplicably low, representing a serious opportunity cost for the nation. By the standards of the world's leading research universities, it would not be unreasonable to expect the ANU to have some three times as many research students than it currently enrolls.

Current government policy limits growth in domestic research enrolments and lacks incentives enabling the best students to attend the best universities.

*5. Accordingly, we recommend that the Australian Government removes its restrictions on the number of domestic students who can undertake higher degree research studies at ANU. [see pages 43-45].*

Greater use could also be made of the capacity of ANU to offer postgraduate research and coursework programs to international students, thereby advancing Australia's networks for building long-term relationships, especially in the Asia-Pacific region.

*6. We also recommend that ANU develops a more strategic approach to the establishment and award of significantly more postgraduate scholarships -*

*especially for research training, but also for postgraduate coursework students.*  
[see page 68].

### **Research-informed professional development**

Educational and professional programs building social and economic benefits for the Asia-Pacific could be a central part of Australia's evolving engagement with that wider region. The programs would also, as an area of professional studies within ANU, offer considerable growth in a diversified funding base.

*7. We recommend that ANU purposefully constructs alliances with governments, and public and private agencies to enhance professional studies.* [see pages 55-56].

### **Benchmarking educational quality**

ANU should continue to set its sights to the peaks of international excellence in research and research-led education.

*8. To confirm its success in translating research performance into excellent research-led education, we recommend that ANU develops reciprocal arrangements with other research-intensive universities internationally, explicitly to benchmark the quality of its education and to substantially expand the overseas experience of study.* [see page 52].

### **Expanding ANU's national engagement and public policy role**

The University has a major opportunity to exploit its national capital environment, its links with government, and the range of its academic disciplines to engage vigorously and constructively in public policy analysis and projection.

*9. We recommend specifically that ANU expand its collaborative research and policy development with the agencies of government, and engage in "action research" which draws from the practice of public administration and policy development in government, and make this a distinctive feature of the ANU national mission.* [see pages 59-60; 72-74].

By doing so, ANU can mark out a characteristically individual role. The National Information and Communications Technology Centre of Australia (NICTA) is, even by US standards, a great example of community collaboration with ANU functioning as the national hub. We see a potential for much stronger collaboration between ANU and the National Library of Australia, CSIRO and other national institutions.

*10. Accordingly, we recommend that ANU take positive steps to strengthen its links with other national institutions.* [see pages 74-75].

## **Leading in Asia and connecting with Europe and the Americas**

ANU also has the singular capacity of becoming a pre-eminent 'Asia University', functioning as a catalyst for research, a generator of professional leaders, and a window into Asia for the rest of the scholarly world.

*11. We recommend that ANU develops an active agenda of engagement with the Asia-Pacific region, involving:*

- *strategic alliances with the Region's finest universities, and research institutes and academies;*
- *effective fellowship schemes to draw in the most talented research and post-doctoral candidates;*
- *long-term co-operative and multilingual research and educational activities;*
- *an ongoing dialogue of close association between researchers in the Region with ANU as the conference hub of new knowledge exposition; and*
- *a partnership with government and NGO strategies in Asia as a key component of the national outreach - as Australia comes to occupy its special role in the Region, as its own neighbourhood of interests and identity .[see pages 75-78].*

## **Publishing in leading journals**

While several of the external assessors of ANU research, in the physical sciences, philosophy and other areas commented that the research was world class and published in the best journals, several other external assessors commented on the lower than expected proportion of papers, in certain other fields, that were published in leading international journals. Meeting the challenge of publication in internationally esteemed journals may well help address another concern raised by some assessors, that research conducted for practical national policy purposes was not always conceptually or methodologically ground-breaking.

*12. Accordingly, we recommend that ANU continues to raise its sights in terms of the quality of journals for its research publications, and aims even higher in meeting expectations of the most creative research approaches, based on the flexibility provided by the block grant. [see pages 40-41].*

## **Establishing financial sustainability**

While the University enjoys a sound budgetary position, is strategically well managed and has achieved revenue growth in recent years, it has little discretionary income and limited reserves to meet the costs of a backlog of building replacements and rehabilitation requirements, and the renewal of expensive research infrastructure that is so important in attracting and retaining the world's top scholarly talent.

The University must implement closely defined strategies for diversifying its sources of revenue growth in ways that are consistent with its mission and values.

*13. We recommend that ANU expand its revenues through greater levels of national public policy service, and especially by growing its provision of*

*professional and graduate education, to meet national and international needs.*  
[see pages 67-68; 72-73].

We note that these are contested areas and do not guarantee consistently high returns. We believe that ANU must retain the capacity to undertake long-term and large-scale research that may have the potential to be policy relevant or commercially applicable but is not circumscribed by limited notions of relevance and is not motivated by a desire for profit.

The distinctive strength of the ANU derives significantly from the stability and flexibility afforded by the block grant for the Institute. Its gradual erosion is a major cause of concern.

*14. Accordingly, we recommend that the Australian Government sustain and progressively increase the block grant for the Institute of Advanced Studies over 2005- 2010.* [see pages 64-67].

### **Internal integration**

While ANU has clear strengths in specific research disciplines, the level of interdisciplinary collaboration across the University is less than optimal. We observed a number of dynamic cross-disciplinary projects, notably in the Humanities, but we were disappointed to see many small areas operating separately, especially in the Social Sciences. The recent formation of National Institutes is helping to coordinate the University's planning and its projection to external communities. In fields such as health, economics, environment, and Asia-Pacific studies there is scope for better collaboration of effort to take full advantage of the University's special academic attributes. Closer collaboration may be facilitated by co-location or even integration of some academic units.

Most importantly, a more porous notion of the Institute would be beneficial to both staff and students: it would give all younger staff the opportunity for gaining teaching experience and assist them in their careers; it would give older research staff the opportunity to be refreshed through engagement with the challenges that young minds present; and it would give students more frequent and direct exposure to some of the world's leading researchers whose knowledge is ahead of anything they could read or hear from others. Above all, the inter-twining of the Institute within the fabric of one University is an essential ingredient of productivity improvement, not least through the greater opportunity for staff of the Faculties to concentrate on their research.

*15. Accordingly, we strongly recommend that ANU continues to improve internal cooperation and integration for cross-disciplinary collaboration, as well to reduce duplication of effort and achieve efficiency gains. In particular, the University should take advantage of opportunities as they arise to form larger internal units, regarding the Institute of Advanced Studies as a porous component of ANU through which academic staff from all parts of the University may move from time to time. Special consideration ought to be given to the formation of a virtual research school for the Humanities.* [see pages 41-42; 69-71].

## **Matters for further consideration**

The following matters relate to aspects of our terms of reference that we had insufficient time to consider. Rather than make specific recommendations about them we suggest they are matters the University itself should further explore.

### ***further analysis of research-led education***

There are significant areas of research strength at ANU that are not reflected in the undergraduate curriculum. We would encourage ANU to analyse the areas of research strength identified in this review and consider areas for the further development of undergraduate and graduate education programs, including such areas as Asia-Pacific Studies, Environmental Studies, and particular fields of research that have an impact on public policy, such as criminology [see pages 52-55].

### ***the international student experience***

The Committee became aware of discussions among Australian universities, and within ANU, regarding the quality of "the experience" of international students in their learning, and in their interactions on campus and in the wider community. As we did not have sufficient time to investigate the issues, we suggest the University consider undertaking a specific survey of international student perspectives [see pages 50-51].

### ***staff development***

Along with many Universities, ANU faces challenges associated with developing and retaining exceptional staff functioning in increasingly cross-disciplinary, international environments. Aging staff profiles, gender imbalance, the need to provide career opportunities for new staff, multi-skilling and leadership development are all pertinent issues that need to be addressed.

We encourage ANU to review career development opportunities for staff and consider:

- aligning career development opportunities for staff with future directions of ANU research and teaching, including commercialization;
- encouraging cooperation in approaches to staff development to reduce duplication and share resources effectively;
- creating an environment which enhances opportunities for staff to collaborate on learning activities;
- effectively manage staff development expenditure to ensure resources are focused on areas of greatest need; and
- reviewing and evaluating the quality and outcomes of staff development provided by ANU [see pages xvii; 13].

## ***ANU at a Glance***

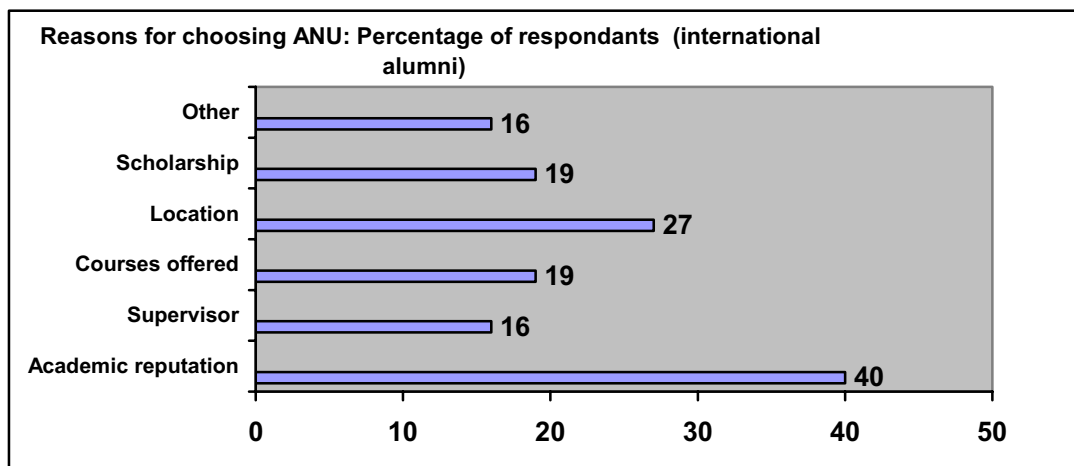
### **STUDENTS**

- ANU's student body has grown from 8,205 people to 10,698 in four years
- 29% of students are in postgraduate programs, and 37% of these postgraduates are international students.
- Overall, 23% of ANU students are from overseas.
- International students primarily cite "academic reputation" as the reason they chose ANU.
- A high proportion of young undergraduates is a hallmark of elite universities – ANU attracts 50% of undergraduates directly from high school.
- 40% of ANU undergraduates are pursuing combined degrees.
- Local demand for undergraduate education from school leavers is projected to decline.

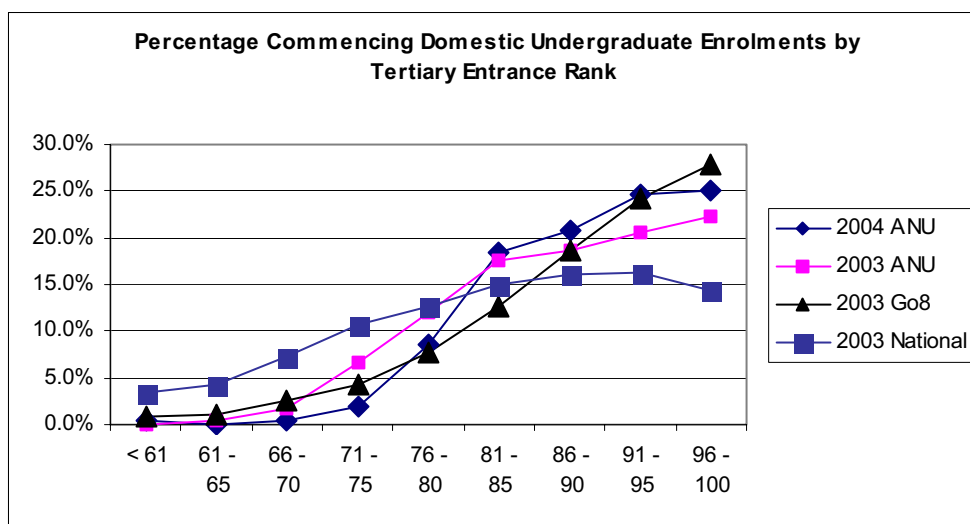
### ***Equivalent full-time student enrolments by program and international / domestic status in 2004***

<b>Program</b>	<b>Domestic/ International</b>	<b>Enrolments</b>
Higher Degree Research	Domestic	1089
	International	431
<b>Higher Degree Research Total</b>		<b>1519</b>
Postgraduate Coursework	Domestic	847
	International	685
<b>Postgraduate Coursework Total</b>		<b>1532</b>
Undergraduate	Domestic	6300
	International	1200
<b>Undergraduate Total</b>		<b>7500</b>
Non-award	Domestic	25
	International	122
<b>Non-award Total</b>		<b>147</b>
<b>Grand Total</b>		<b>10698</b>

### Reasons for choosing ANU

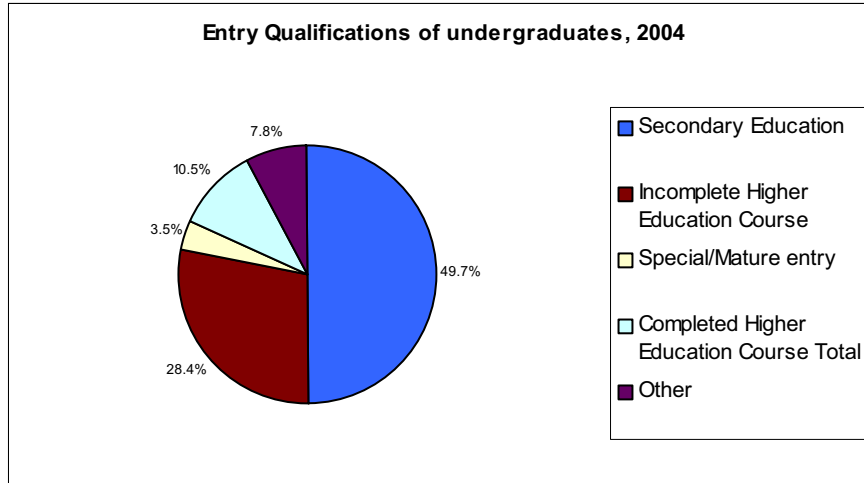


### Tertiary Entrance Ranks



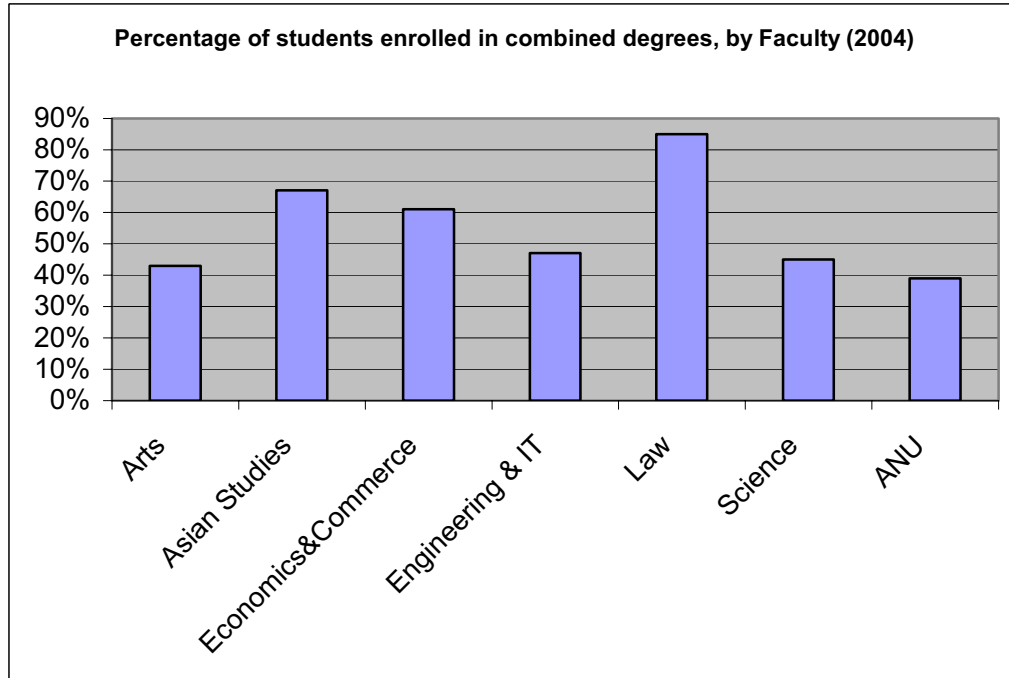
Source: Universities Admissions Centre, 2003 and 2004

***Basis for ANU Admission 2004***



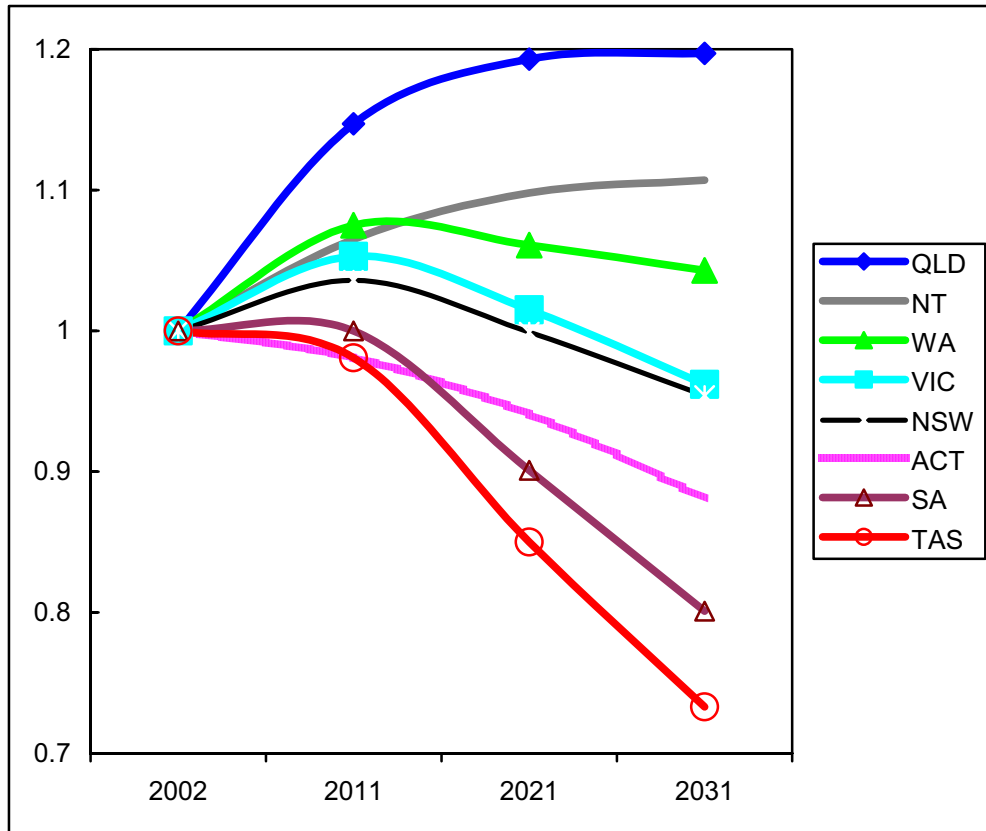
Source: Universities Admissions Centre 2004

***ANU Student Enrolments in Combined Degree programs***



Source: ANU Statistics Office

**Population projections by state - 15 to 24 year olds**



Source: ABS Population projections, 2002

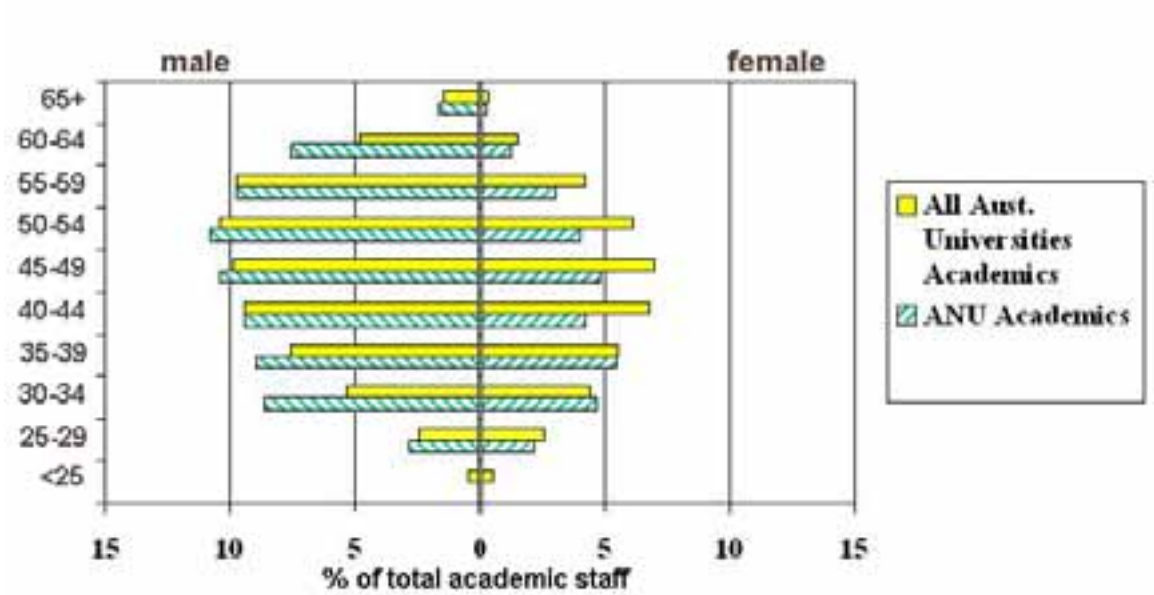
## STAFF

- The ANU has the largest number of research-only academic staff in Australia.
- The ANU faces the challenges of an ageing workforce.
- The University also faces the challenge of a gender imbalance in all age groups among its academic staff.

### *Staff at Schools, Faculties and Centres, 2003*

Academic Area	Academic			TOTAL	Academic Area	Academic			TOTAL
	RO	TtR	General			RO	TtR	General	
<b>Institute of Advanced Studies</b>					<b>The Faculties</b>				
Resource & Env Studies	15	1	15	31	Arts	0	00	33	129
Medical Research	82	-	180	262	Asian Studies	-	30	7	37
Astronomy & Astrophysics	21	1	53	75	Economics & Commerce	2	67	20	88
Biological Sciences	78	-	102	180	Engineering & IT	6	33	46	86
Chemistry	51	-	67	117	Law	2	42	29	73
Earth Sciences	45	-	71	116	Medical School	1	5	6	12
Info Sci & Engineering	22	-	17	39	Science	40	108	92	240
Pacific & Asian Studies	86	4	93	182	Nat'l Inst of the Arts	-	73	53	125
Physical Sc & Engineering	96	1	93	190	<b>The Faculties Total</b>	<b>59</b>	<b>445</b>	<b>286</b>	<b>790</b>
Social Sciences	86	6	74	166	Other	1	16	783	799
<b>IAS Total</b>	<b>581</b>	<b>13</b>	<b>764</b>	<b>1,358</b>	<b>TOTAL STAFF</b>	<b>743</b>	<b>504</b>	<b>1,933</b>	<b>3,180</b>
<b>Centres</b>					<small>RO = Research Only; TtR = Teaching and Research</small>				
Asia Pac Sch of Econ & Govt	9	14	29	52					
Aboriginal Econ Policy Res	11	-	5	16					
Cross-Cultural Research	20	-	8	28					
Mathematical Sciences	25	2	4	30					
Mental Health Research	7	-	17	23					
Humanities Research	5	2	9	16					
Epidemiology & Pop. Health	24	4	17	45					
Nat'l Grad Sch Management	2	-9	12	22					
<b>Centres Total</b>	<b>102</b>	<b>30</b>	<b>101</b>	<b>233</b>					

***Age and Gender Distribution of Academics at the ANU and in Australia***



Source: DEST Higher education Statistics: ABS Labour Force by Age and Gender

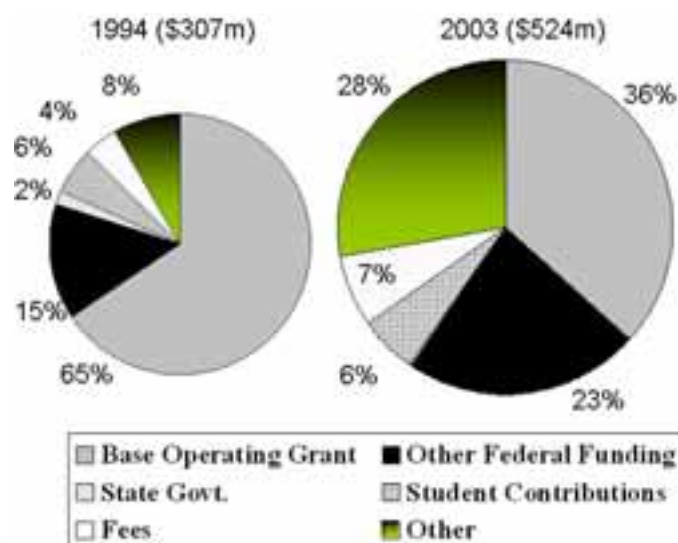
## FINANCES

- ANU revenue has grown by 70% from \$307 million to \$524 million in ten years.
- The University has diversified its revenue since 1994, with only 36% of revenue from the Commonwealth Base Operating Grant.
- Competitive research funding is now a major source of the ANU's income.

### *ANU revenue sources 2000-2003, by percent*

Year ended Dec. 31	2000	2001	2002	2003
Operating grant (including HECS & PELS)	56.8	51.7	54.3	41.3
Research funding	9.5	10.0	14.0*	22.7**
Full fee-paying student income	4.2	4.8	6.0	6.8
State grants	0.2	0.2	0.6	0.3
Consultancy, contract research and private grants	6.9	7.1	8.3	8.4
Investment Income	12.4	10.3	5.4	7.4
Other fees and charges	9.7	9.2	10.8	13.2
Other revenue	0.3	6.8	0.6	0.1

### *ANU revenue sources, 1994 and 2003*

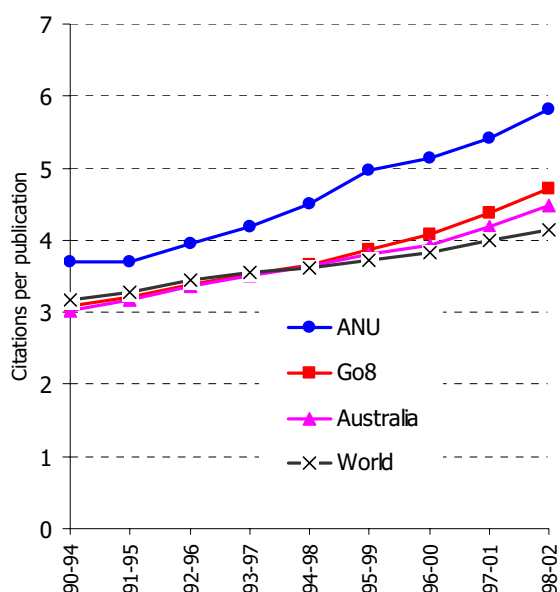


Source: DEST Higher Education Finance Statistics, 1994 and 2003

## PERFORMANCE

- ANU has a high volume of high quality research outputs.
- On average, each ANU researcher produces at least one work rated in the top 25% in the world, and some areas exceed three.
- ANU graduates report higher levels of satisfaction than do all universities, particularly with intellectual climate.

### *Citations per publication, selected comparisons*



	No of Pubs	Cpp	Impact relative to World
<b>ANU</b>	<b>7464</b>	<b>5.81</b>	<b>1.34</b>
Go8	53460	4.71	1.09
Australia	97131	4.47	1.03
World	3454179	4.33	1.00

Source: The Australian National Citation Report, prepared by the Institute for Scientific Information® Inc. (ISI®, Philadelphia, Penn., USA: © Copyright Institute for Scientific Information 2002. All Rights Reserved.

**Publications**

<b>Unweighted Research Publications 2002</b>							
	FTE Academic Staff	Books Authored research	Book Chapters	Article in Scholarly Refereed Journal	Full Written Paper Refereed Proceedings	All	All Publications per FTE Academic
ANU	1,160	68.67	333.6	1,226.72	158.74	1787.73	1.541
Australia Output (net of ANU)	29,838	485.3	2,556	17,810	6,885	27,737	0.93
Go8 Output (net of ANU)	12,234	254	1,299	10,115	2,581	14,248	1.165
ANU output:*							
Faculties		19.6	104.0	324.3	65.7	513.6	
IAS & Centres		49.1	229.6	902.4	93.0	1274.1	
ANU staff as % of all staff	3.8%						
ANU output as a % of all output		12.4%	13.1%	6.9%	0.02%	6.5%	
Publication profile: % of total output in a particular category							
Australia		1.8%	9.2%	65.1%	24.8%		
Go8 (net of ANU)		1.8%	9.1%	71.0%	18.0%		
ANU		3.8%	18.7%	68.6%	8.8%		
Source: AVCC, Summary of Unweighted Publications Data by Category, 2002; * ANU publications are the audited numbers found at <a href="http://www.anu.edu.au/ro/data/2002statistics.php">www.anu.edu.au/ro/data/2002statistics.php</a> . Staff numbers are drawn from Commonwealth department Education, Science and Training, <i>Selected Higher Education Statistics, Staff, 2002</i> .							

**Number of works rated in top 25% internationally per ANU Researcher**

Research works in the Top 25% of works worldwide	Submitted Papers*	Participating Staff	Expected Result**	Actual Result	Actual to Expected Outcome ratio
Asian and Pacific Studies	746	216	29.0	68.8	2.38
Astronomy and Astrophysics	123	27	22.0	75.3	3.43
Australian Indigenous Studies	216	76	35.2	62.6	1.78
Biological Sciences	327	75	22.9	68.1	2.97
Biomedical Research	542	153	28.2	60.7	2.15
Business and Commerce	175	48	27.4	53.2	1.94
Chemical Sciences	306	75	24.5	71.1	2.90
Earth Sciences	369	103	27.9	63.5	2.27
Economics	419	118	28.2	55.1	1.96
Environmental Research	205	62	30.2	48.4	1.60
History and Archaeology	487	147	30.2	75.3	2.49
Info. Sciences and Engineering	371	114	30.7	63.3	2.06
Language and Culture	471	176	37.4	75.2	2.01
Law	437	173	39.6	62.6	1.58
Mathematical Sciences	250	62	24.8	83.8	3.38
Philosophy	129	34	26.4	89.2	3.38
Physical Sciences	560	133	23.8	83.9	3.53
Policy and Political Sciences	438	130	29.7	70.4	2.37
Psychology and Mental Health	186	50	26.9	55.8	2.08
Studies in Human Society	600	184	30.7	63.1	2.06
Visual Arts	62	26	41.9	67	1.60

\*up to 5 works per researcher over the period 1995-2004

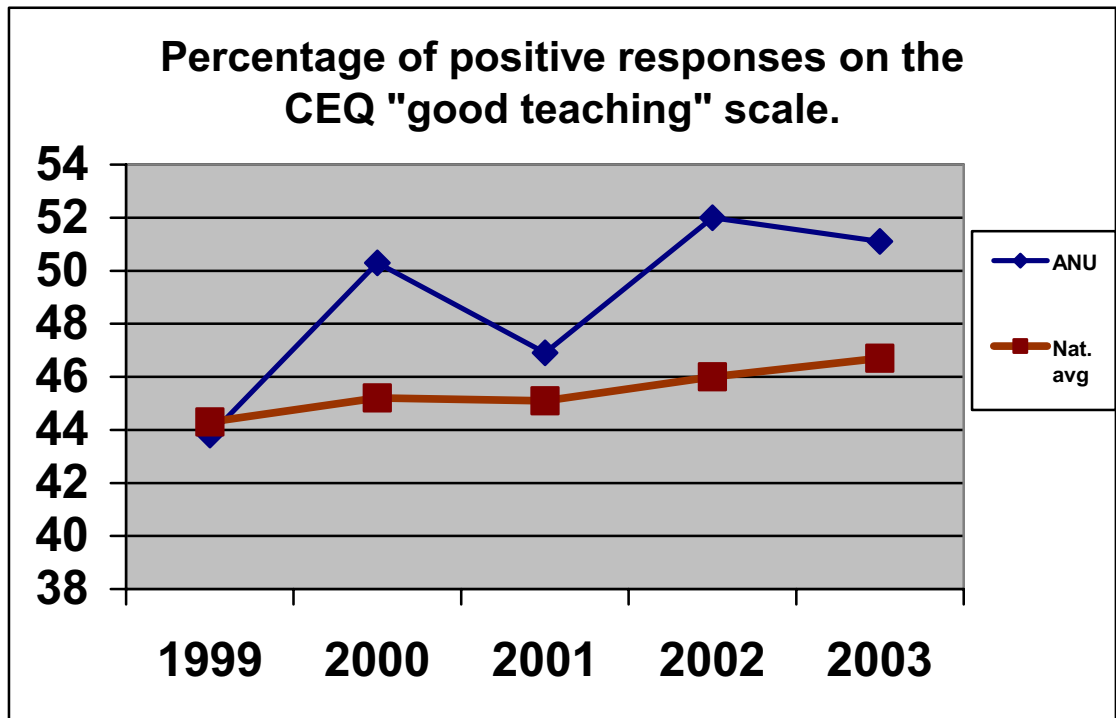
\*\*1 work per researcher on average assessed as being in top 25% of world research in the discipline

**Graduate Satisfaction (Course Experience Questionnaire) 2003**

Scale	ANU agreement (%)	National Agreement (%)	Difference
Good Teaching	51.1	46.7	4.4
Generic Skills	66.3	63.0	3.3
Graduate Qualities	72.1	69.1	3.0
Intellectual Motivation	75.1	70.9	4.2
Overall Satisfaction	74.4	68.4	6.4

Source: Graduate Careers Council of Australia, 2004

**Graduate Satisfaction, Teaching (Course Experience Questionnaire), ANU and Australia**



*Source: Graduate Careers Council of Australia, 2003*

## **Background**

*"...the justification for a university is that it preserves the connection between knowledge and the zest for life (i.e., via the necessary movement of questions, ideas and scholarship between professional schools and centres of research and teaching in the Arts and Sciences) and by involving the young and the old in the imaginative (i.e., speculative and reflective) consideration of learning."<sup>3</sup>*

### **ANU and its role**

ANU began in 1946 as a research university, specifically,

*"To encourage, and provide facilities for, post-graduate research and study, both generally and in relation to subjects of national importance to Australia."<sup>4</sup>*

The Minister at the time of its establishment defined the mission of the institution with a clear vision and with strong national aspirations. The new University foundation was intended

*"to advance the cause of learning and research in general, and take its rightful place among the great universities of the world. With the establishment of an Australian national university ...Australia will have taken one more step to align itself with the great and enlightened nations of the world."<sup>5</sup>*

Along with other national institutions in Australia's Federation, ANU was established to be of enduring significance in the post-War life of the nation – to support the development of national unity and identity, to improve Australia's understanding of itself and its neighbours, and to contribute to economic development and social cohesion.

The special responsibility of ANU to contribute to nation building is shared by the National Library of Australia, the National Gallery of Australia, the Australian War Memorial, the National Archives of Australia, the National Museum of Australia, the Australian Institute of Aboriginal and Torres Strait Islanders Studies, the National Botanic Gardens, and the National Screen and Sound Archive. They are all based in the national capital, Canberra.

ANU commenced teaching undergraduate students in 1960. As the 50<sup>th</sup> anniversary History of the university by Foster and Varghese has admirably set out, ANU has now evolved into a research and teaching university, with national hubs and international networks of scholarly activity and outreach services.

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<sup>3</sup> Alfred North Whitehead, (1929), *The Aims of Education and Other Essays*. New York. Macmillan.

<sup>4</sup> The Australian University Act 1946

<sup>5</sup> J. J. Dedman, *House of Representatives Hansard*, Vol. 187, p.567

ANU is distinctive among Australian universities in its research intensity, the relatively small scale of its undergraduate enrolments, its national capital location, its defined mission for contributing to nation building and advancing Australia's place in the world, and the block funding it receives for the Institute of Advanced Studies (IAS). It is the only research university established under an Act of the Australian Parliament.

ANU is expected to make important contributions in the national interest and to offer academic leadership and support to major national agenda for scientific advancement and technological innovation. Most recently the expectation has grown that it will advance the understanding of, and the construction of solutions to, social and environmental problems. The university is looked to in providing facilities and specialised equipment for collaborative national use - such as computation and data-grid services, observatory facilities, measurement instrumentation, information repositories and sustainable digital collections.

### **Australian National University Act 1991**

#### **Act No. 131 of 1991 taking into account amendments up to Act No. 114 of 2004**

##### ***S5 Functions of the University***

- (1) The functions of the University include the following:
  - (a) advancing and transmitting knowledge, by undertaking research and teaching of the highest quality;
  - (b) encouraging, and providing facilities for, research and postgraduate study, both generally and in relation to subjects of national importance to Australia;
  - (c) providing facilities and courses for higher education generally, including education appropriate to professional and other occupations, for students from within Australia and overseas;
  - (d) providing facilities and courses at higher education level and other levels in the visual and performing arts, and, in so doing, promoting the highest standards of practice in those fields;
  - (e) awarding and conferring degrees, diplomas and certificates in its own right or jointly with other institutions, as determined by the Council;
  - (f) providing opportunities for persons, including those who already have post-secondary qualifications, to obtain higher education qualifications;
  - (g) engaging in extension activities.
- (2) In the performance of its functions, the University must pay attention to its national and international roles and to the needs of the Australian Capital Territory and the surrounding regions.

Importantly, ANU has the capacity to act as a conduit to international networks for all Australian institutions. It attracts leading researchers from all over the world to live and work in Australia. It maintains strong collaborative relationships with many of the world's centres of expertise and shares the usage of the world's most advanced research technologies.

In a recent strategic publication, *ANU to 2005*, the University set out its aspirations, and these formed an important reference point for our Review:

*In Research – ANU will position itself as one of the world's top universities in its selected fields;*  
*In Education – ANU will equip graduates with the attributes and skills that will enable them to take their place among their peers from the world's top universities; ANU degrees and diplomas will thus draw from, and be based on, high internationally-benchmarked levels of scholarship.*

### **The origins of the 2004 Review**

We understand that the decision of ANU Council to commission a comprehensive external review of the University arose from a number of considerations.

There had been a Review of the Institute of Advanced Studies in 1995 which recommended a further review after six years. That further review was deferred following an agreement with the Government as the Institute entered into the competitive research grants schemes of the Australian Research Council and the National Health and Medical Research Council from 2001. As that process of competitive entry was bedding down, and the matter of a further review was considered in 2003, ANU formed the view that it would be a backward step to review the Institute in isolation from the Faculties and University Centres, given the considerable effort made in developing closer linkages among the several parts, in teaching and community service as well as in research. A more integrated, whole-of-university approach was considered appropriate.

Concurrently, a general debate about the future direction of higher education financing policy had given rise to the claim that Australia was lacking "a world-class university". However, the 2004 ranking of the world's top research-intensive universities (by the Shanghai Jiao Tong University Institute of Higher Education) placed ANU at 53 within the Top 500 universities, with only one other Australian university in the top 100. Even if they are suggestive indicators, such rankings invariably bring many criticisms over the limitations to their methodologies and the comparability of institutions from different national systems. ANU accordingly sought to verify its international academic standing by more comprehensive, qualitative and comparative means.

In particular, using peer review and peer perception, ANU also wished to obtain an informed, external view of its performance as a guide to the development of strategies for its pursuit of international excellence. Such informed assessment is there to inform ANU community in developing its strategic plan to 2010 through the University Executive and Council.

## **Our task**

The Review Committee was convened to make an independent assessment of the quality of the University's performance, essentially across its academic functions. We had access to the University and its records. We were provided with extensive data sets, including results of surveys undertaken specifically for the review. We are satisfied that we had sufficient access to the University, and sufficiently reliable information, to form independent judgements.

This Review examines the functions of ANU – research and teaching and community service – in all of its academic organisational units. A separate review of Music performance at ANU had recently been completed and its outcomes were being considered within the University at the time of our Review. Given that staff were in the process of adjusting to recently announced changes, we decided to exclude music performance from our exercise. A Review of the Administration of the University was concluded separately, but provided to the Review Committee. Our focus has necessarily been on scholarly outcomes.

The *Terms of Reference* as approved by ANU Council are at Appendix A.

## **The process of the 2004 Review**

ANU prepared a *Capabilities and Performance Statement* for the information of the Review Committee. It provides an extensive range of evidence about the research and educational performance of ANU, including:

- Comparative performance data for ANU against all other Australian universities;
- Evaluations by some 285 external peers of the quality of ANU research outputs by discipline and by academic unit;
- Contextual Statements prepared by Deans and Directors for each University Centre, Faculty and Research School;
- Bibliometric analysis of the relative impact of ANU research by discipline;
- Surveys of domestic and international alumni of the ANU;
- A report of focus group discussions held with students and conducted by an independent survey organisation;
- A report of focus group discussions held with external stakeholders and conducted by an independent survey organisation;
- Results of graduate destination and satisfaction surveys over several years;
- Findings of internal surveys of student perceptions of ANU teaching over several years;
- The 2004 report on progress in responding to the findings of the 2001 Review of ANU administration.

The Review Committee had two meetings. The first took place during the week of 19-23 July on the ANU campus in Canberra. The second meeting, to finalise our report, occurred in the second week of September at Oxford University. The Committee considered the self assessments and external assessments that ANU had prepared, and the other supporting materials made available. Our observations are also informed by

our meetings with the University Executive, Deans and Directors and course convenors, by selective discussions we had with academic staff and nominated students, and by visits to Research Schools, Faculties and Centres. We also had discussions with some external users of ANU services and civic leaders associated with ANU.

We benefited greatly from the work of an external moderation panel, chaired by Professor Jeremy Knowles (Dean of Arts and Sciences at Harvard University) that was convened to pave the way for the Review Committee by making comment on the manner and style of the information compiled by ANU. Professor Knowles was assisted by Professor Sue Richardson of Flinders University, Professor Jill Roe of Macquarie University, and Professor Nick Saunders of Monash University. They gave detailed attention to the results of the peer assessments of ANU research. The Review Committee had direct electronic communications with Professor Knowles, and he also provided written advice in response to questions.

The Committee saw its own role as one of assuring ourselves about the strength of the claims made on the basis of internal and external evidence; and then considering the implications of the evidence for the future of ANU. Our report should therefore be read alongside the separate *ANU Capabilities and Performance Statement* (and its related appendices).

### **Changes internal to ANU since the 1995 review**

*At its best the contemporary university should be characterised by intellectual conversations both across the generations and across the various academic disciplines.<sup>6</sup>*

In this section of our report we take stock of the achievements of ANU over the past decade and assess the present strengths of the University with regard to future challenges. To place our observations in perspective, we also considered the findings of previous reviews in 1978 and 1988.

In 1995, the Institute of Advanced Studies was subject to a comprehensive external review. The review was jointly sponsored by the ANU and the Australian Research Council (ARC). Chaired by Dr Keith Boardman, the review took account of evidence presented by the University, reports of peer review committees that examined each of the Schools and Centres of the Institute, bibliometric and contextual data, interviews with staff and students, submissions from interested parties, and meetings with members of government bodies and research organisations.

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<sup>6</sup> Harold. T. Shapiro, (2001), "Professional Education and the Soul of the American Research University", Ann Arbor, Michigan.

The ARC reported the outcomes to the Government in December 1995 in the following terms:

*The Institute of Advanced Studies is a national asset which has a unique place in the Unified National System of universities in Australia. It has high calibre staff, excellent facilities and freedom from the responsibility of undergraduate teaching. Through the security provided by its block funding and its magnitude, the Institute has the capacity to undertake the type of long-term and large-scale research projects which are difficult to undertake when supported only by competitive research funding schemes. Block funding also provides the potential to undertake high-risk/high-cost research which is unlikely to yield an outcome in the short to medium term.*

*The Australian Research Council finds that, overall, the Institute of Advanced Studies undertakes basic research of very high quality as judged by international standards and demonstrates intellectual leadership across many disciplines. The Institute also provides an excellent environment for research training at both the postgraduate and postdoctoral level. This finding is supported by the assessments of the eleven School and Centre peer review committees and the Institute Review Committee.*

The ARC recommended that ANU give attention to improvement in four main areas:

- increasing the contribution of the Institute to research training;
- strengthening the ties between the Institute and the Faculties;
- extending the Institute's research collaboration with other Australian universities; and
- developing its strategic planning processes, including its consultative processes with major Australian research agencies.

The University's progress in each of these areas is discussed below.

Generally, we were impressed by the extent of, and the acceptance of, change achieved by ANU since the 1995 Review of the Institute of Advanced Studies, and especially since the year 2000. Committee members well understand the complexities of achieving far-reaching structural, procedural and cultural change in university environments. The ANU in 2004 presented itself to us as a focussed university of positive morale and first-class academic achievement.

By way of illustration, recent achievements since 2000 include:

- Total growth in student enrolments of 30%
- Growth in higher degree research enrolments of 32%
- Growth in postgraduate coursework enrolments of 44%
- Growth in international student enrolments of 110%
- Revenue growth of 40% since 2000

- A rise in the cut-off score for entering domestic undergraduate students from 70% in 2000 to 80% in 2004
- An almost complete turnover of senior academic and administrative personnel since 2000.

While several of the increases are from a distinctly low base, they do establish positive trends for the future.

### ***Utilisation of research training capacity***

The ANU has built up higher degree research student numbers at a much faster rate than for the Australian system as a whole:

- Research student numbers at ANU have grown from 1053 in 1994 to 1687<sup>7</sup> in 2003 – a rise of 60% over the decade (compared with 48% for all universities).
- The Institute of Advanced Studies has increased its share of ANU research enrolments from 25% in 1994 to 47% in 2003.

Notwithstanding this progress, as discussed in Chapter 4 there is considerable further room to make greater use of ANU research training capacity for both Australian and international higher degree research students.

### ***Enhancing educational programs and research training***

The University has worked hard following its internal review of undergraduate education in 2002. Notable progress has been made in raising the quality of the student intake, increasing cross-program choices and flexibility for students, improving the quality of teaching and curriculum materials, moderation of student assessments at Faculty and inter-Faculty levels, the promotion of research-led education and the introduction of the innovative PhB degree. The new culture of commitment to research-led education provides a basis for its extension to all ANU students.

A commitment to raise the quality of research training and supervision is also evident. The ANU has introduced staff development programs for research degree supervisors. It has also introduced a range of innovative research student services through the Graduate School, the Academic Skills and Learning Centre, and the Division of Information and other central areas, including the Graduate Teaching Program, the Statistical Consulting Unit, the Graduate information Literacy Program, and the Academic and Professional Skills Program.

### ***Links across Schools, Faculties and Centres***

This Review Committee is particularly pleased to see a much closer integration of the Institute with the University Centres and Faculties than identified in 1995. In several areas there are strong relationships through joint appointments, cross-teaching and

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<sup>7</sup> 1687 students equals to 1519 full-time equivalent student enrolments

periodic secondments of staff. The PhB initiative makes good use of the capabilities of researchers in the Research Schools and Centres in immersing undergraduates in the research culture of the ANU.

There remain, however, islands whose activities are detached from the mainland if not the heartland of the University. And there are some fields of academic activity - such as Economics, Asia-Pacific Studies, Health-related studies and Environmental studies - where greater synergies could be obtained by greater coordination. These are not novel observations. The 1978 Review of the Research School of Social Sciences expressed disappointment "to find the degree of communication between departments, and sometimes even within them, was less than one might have hoped."<sup>8</sup>

The formation of National Institutes within the ANU is a promising initiative, bringing together the academic effort of colleagues in discrete units within a more coordinated and strategic approach to the academic activity of the University, which is now somewhat overdue. The establishment of two Divisions within the University – Science, Health and Engineering; and Social Sciences, Humanities and the Arts – combines research and teaching expertise, and promotes collaboration across the University. Alongside these structural changes, we also observed a genuine commitment to collaborative development of a research-led education culture at ANU. The objectives of these reforms are far-reaching, and they will take some time to be fully realised.

### ***Collaboration with other universities and agencies***

An effort is being made to extend ANU's collaboration on research within Australia and internationally. ANU's Annual Report 2003 lists over 1200 research projects involving collaboration with researchers from other universities and research organisations around the world. The ANU Research and Research Training Management Report 2004-06 lists an extensive range of ANU collaborations with Australian universities and research organisations and industry bodies. ANU hosts a number of national centres that involve various partners and attract visiting experts. Access to NHMRC and ARC funds for the research schools has afforded a major shot in the arm to all groups.

ANU personnel are active in national and international engagement, particularly in the areas of Asia-Pacific relations and policy-making at the nation's capital. ANU works in partnership with other national institutions, such as the National Library of Australia in the joint management of Asian language materials. The international visibility of ANU's Research Schools, Centres and Faculties and the effort they commit to collaboration in turn attracts overseas scholars on a regular basis. These visitors are frequently available for lectures and consultations at other Australian universities.

International scientists are attracted to ANU, and ANU graduate students are welcome visitors in some of the top laboratories around the world. This experience of working with top students in other countries, as well as their faculty mentors, provides educational and cultural experiences that greatly expand the student's development, and eventual value to Australia.

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<sup>8</sup> Review of the Research School of Social Sciences, August 1978, chaired by Professor Clark Kerr.

### ***Strategic planning and budgeting and performance reporting***

The University's Budget allocation process is transparently linked to strategic goals, and the performance of Faculties, Schools and Centres is assessed annually against them. This technique has a powerful, integrating influence across the University.

At the time of this review, ANU also faces great challenges. As with many other parts of the world, government budgets supporting public universities are declining in real terms. The problem in Australia is exacerbated by demographic trends, by lack of a tradition of generous philanthropy, and by a resource-based economy still retarded in the development of high-tech and value-added industries. ANU has responded with a program to diversify its portfolio of revenue sources, but much more can still be done and will need to be done.

### ***Governance and administration***

The legislation under which ANU is established was substantively amended in 2003, streamlining the composition of the governing Council and enabling more flexibility in internal governance. An independent review of administration was conducted in 2001. Reporting on progress three years after that review, immediately before our visit to ANU, the consultant commented favourably on the advances that had been made:

*In the two and a half years since the 2001 Review of Administration there has been a sea change in the administration of the ANU. In particular, the concept of an 'enabling culture' has been widely adopted by staff in the administrative divisions both central and among the Faculties, Centres and Research Schools and in large part the academic community. Morale has turned for the better and there is a noticeable 'can do' attitude replacing the previous sense of inefficiency and drift. While culture change can only be part complete in the time since the 2001 Review the commitment of staff is energising, and giving impetus and clear direction to the multitude of specific reform processes undertaken within the University.<sup>9</sup>*

### ***Information infrastructure support***

Commendably, the University has implemented an integrated information environment in which services and facilities are closely linked to research and education goals. Libraries, computation laboratories, collaboration studios, on-line research equipment, and digital repositories are managed within a single, cohesive framework. Access to scholarly information based in printed books, journals, and manuscripts, is tightly linked with access to a wide range of digital resources, including datasets, research outputs and digital archives valued by the University's academic communities.

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<sup>9</sup> McKinnon Walker, June 2004, "Progress Report, 2001 Review of Administration", Australian National University

The ANU has a particularly strong eResearch group, built up over the past twenty years, which provides national computation and data-grid services and is the host for a national partnership in advanced computation. The ANU is also the lead institution for a national program for sustainable digital collections. These strengths are underpinned by first class computing environments and high-end networking services, the latter also being an area in which the University plays an international leadership role.

## ***The University in a changing environment***

*Universities have held a privileged position because they have focused on the needs of society rather than self gains. In turn they have special responsibilities. But in a market-driven environment this special status is endangered – universities will be pressed to focus on the short-term gain that competitive new forces offer, and will search for ways to maximise institutional revenues rather than pursue the longer-term goals that have formed the backbone of higher education for centuries.<sup>10</sup>*

Over the decade since the 1995 Review of the Institute of Advanced Studies, the operating environment for the ANU has altered substantially. There have been changes to higher education policy and financing, new developments in the provision of higher education and research, and more diverse forms of student demand for higher education.

These changes have been global and every jurisdiction has seen both transformation of institutions as well as the rise of highly competitive dynamics in the allocation of scarce public resources. Universities may well choose to develop their own variants of change. But not to engage in these global changes is to endanger the university itself. Higher education is simply at a hinge of history with exceptional meaning attached to actions over the next decade.

Here we outline those changes with their threatening implications for ANU.

We do so on the understanding that, since its establishment in 1946, the University has indeed contributed to developing Australia's capabilities for research and scholarship, and to promoting Australia's place in the world of knowledge. In particular, the University has worked to:

- inform Australian policies for addressing national and regional challenges;
- enable the local development of Australia's intellectual talent;
- play a key role in transforming the capability of the major State universities;
- attract leading international scholars to Australia; and
- build an international reputation for Australian excellence in research and scholarship.

Continuing and heightened effort in all of these areas is however necessary for Australia to sustain and improve its limited areas of international competitive advantage in the era of globalisation in higher education.

We have asked ourselves how ANU could therefore best add value in the future, given the growing importance to Australia of strong international knowledge networks. We

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<sup>10</sup> Newman, F. (2000), *Saving Higher Education's Soul*. The Futures Project. Brown University.

took account of a number of changes in the operating environment for Australian universities and for ANU in particular. We noted a number of trends that could endanger the University's capacity to contribute as successfully over the next half century as it has contributed over the last half century.

Matters of particular contemporary concern include:

- a reluctance of governments in Australia to invest substantially greater levels of public resources in university development;
- a limited resource base in Australia, and an associated lack of a contributing culture, for private investment in research and innovation;
- the existence of an environment in which public policies facilitate ever greater competition in the supply of higher education services;
- financial incentives directing research and education increasingly to short-term, strategic and applied purposes;
- falling student demand for higher education in Australia from traditional sources alongside growth from new sources;
- changing relative capacities of institutions, resulting from the different opportunities they have for diversifying their sources of revenue growth.

### **The role of modern universities in contemporary democracies**

Universities have never been more important to society than currently. Yet equally, the challenges to higher education have rarely been greater. ANU exists in the eye of the storm.

This may be seen in the complexity of their operations. ANU is no exception. Modern universities have many roles. They constitute repositories of knowledge and expertise. They are communities of learners, enabling individuals to understand and interpret the world around them. They prepare citizens for life and responsible participation in evolving democratic societies. They train people to work in demanding, changing jobs and help them to continue developing their skills. They host research programs that create new knowledge. They establish projects to apply the knowledge that research generates. They contribute their knowledge services to the community, at times functioning as social critics or bearers of uncomfortable messages. They help to enrich the cultural development of communities.

An important role of modern universities in today's fragmented, pluralist societies is to encourage and enable students to examine complex, evolving situations where competing values may be at stake, to employ substantive knowledge and moral reasoning to evaluate the issues involved, and to form their own judgements for appropriate action. Equally important is for students to learn to value and respect cultural differences; and to understand how their knowledge can be put to constructive use for social benefit. The imperative to prepare students for their wider role as citizens of a globalising world implies an increasing commitment to the internationalisation of learning experiences.

Contemporary universities themselves have to balance competing claims from multiple stakeholders in fulfilling their civic responsibilities, responding to market pressures, and safeguarding academic values.

### **Changing patterns of demand for higher education**

In Australia, as elsewhere, population ageing will increase the proportion of government and private expenditures on health and related services, leaving shortfalls in the size and capacity of the workforce and in the taxation base. Sustained productivity improvements will be essential for sustaining economic growth and maintaining living standards. Knowledge, and the clever use of knowledge, will become ever more important to sustaining economies and communities. Universities, while being asked to make effective knowledge contributions, will also have to manage a declining stream of young students and more intense competition for young staff. They will additionally have to compete harder for public funds.

Demand from the traditional university-entering cohort aged 17-24 in Australia has continued to rise through the 1990s and is projected to continue rising until 2011. Thereafter, that age group will decline in numbers for several decades. The ANU will be directly affected by this downturn in school leaver demand within the next few years: the trends are somewhat more marked in the demographics of the ACT.

Notwithstanding demand from young people, the strongest growth in higher education participation over the past decade has been in postgraduate degrees by coursework, where student numbers have more than doubled. Domestic demand for higher degrees by research has been flat for a decade, in part reflecting scholarship shortage at the national and institutional level.

If there is to be further growth in demand for undergraduate places it is likely to come from the working-age population seeking qualification upgrades or a second degree for employment purposes, and from older persons pursuing studies out of personal interest. It is probable that the bulk of future growth for university education from domestic sources will continue to be in areas of graduate education and short courses for professional development, that may lead in time to a postgraduate award. Several of the professions now require postgraduate qualifications for certification to practise and this trend will intensify. Public sector organisations are increasingly encouraging their staff to obtain graduate qualifications. Several countries are investing considerable sums in the professional development of their workforces. These areas of graduate education, domestically and internationally, will present vital and special opportunities for ANU growth.

Universities around the world are having increasing difficulty attracting and retaining top quality academic staff. With the ageing of academic staff, and the prospect of concentrations of retirements in developed nations and the rapid growth of provision in developing nations, it will become ever more challenging to find and hold top quality people. These pressures may well give rise to new forms of international collaboration in university teaching and research in which ANU must be a major player.

## **Changing forms of supply of higher education and research**

The Internet, combined with the increased capacity and accessibility of databases, progress in the speed of computation, the use of virtual laboratories, virtual instruments, miniaturisation, and electronic publishing, have all aided the development of intellectual and research communities and networks in diverse places, including the international collaboration of universities. We see exciting potential in the future use of these new ways and means for learning which will involve ANU. Or they can be read as an alarm bell if the opportunities are not grasped.

Some educationists suggest that universities may be marginalised as these capacities evolve and are more widely adopted, or that new commercial entities "will drive the higher education enterprise toward mediocrity that has characterised other mass media markets such as television and journalism."<sup>11</sup> However, we need to be sceptical of technological hype and determinism. As Guy Neave<sup>12</sup> has noted in discussing the rise of for-profit and corporate universities: "Constructing policy around the merely plausible violates the elementary principle of caution". And Peter Scott<sup>13</sup> reminds us that "accounts of changes in scientific production do not provide us with the firm foundations on which we can build secure scenarios about the future development of higher education."

It is likely that more diverse forms of higher education supply will emerge to meet the growing international demand – new institutions, new mixes of modes of delivery, and new alliances of established higher education institutions with organisations in other industry sectors, involving both the public and private sectors, within and across nation state boundaries. However, while there may well be more intensive competition in low-cost and high volume fields, these new provider types - whose fundamental role is that of low-cost, high-profit knowledge transmission - may well draw on, and generate a higher level of demand for the intellectual capital of the leading research-intensive universities, rather than rival or replace them. Here is a clarion call for ANU.

## **The role of research-intensive universities in knowledge economies**

The research-intensive university provides the essential underpinning of higher education systems and knowledge societies. It has a fundamental role in knowledge creation, application and preservation – the generation and verification of new knowledge, as well as the reflective evaluation and renewal of established knowledge. Research-intensive universities also have a special 'knowledge filtering' responsibility. With knowledge transmission made faster and more accessible through developments in communications and information technology, and the associated proliferation of knowledge disseminators, there is a greater need for intellectual rigour in distinguishing

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<sup>11</sup> James, J. Duderstadt (2000) "A Vision for the Future of the Public University in the New Millennium", University of Wisconsin. Madison.

<sup>12</sup> Guy Neave, (2002), "On Looking through the Wrong End of the Telescope", *Academia in the 21<sup>st</sup> century*. Adviesraad voor het Wetenschaps – en Technologiebeleid. The Netherlands.

<sup>13</sup> Peter Scott, "Changing Players in a Knowledge Society", *Globalisation: What Issues are at Stake for Universities?* Universite Laval, Quebec. Canada.

what is worthwhile from what is not. The special function of research-led universities should here be explicitly acknowledged and their particular needs adequately resourced.

It is critically important for Australia to have intellectual leaders 'at the table' with the world's leading thinkers and experimenters, contributing to international knowledge advancement, sharing in the mutual exchange of ideas and gaining access to leading edge innovations. The research-intensive university is the dominant contributor to knowledge generation and, thereby, a singularly important part of national capability. Of great importance too is the flow of top quality research-trained people into the workforce – those who can advance understanding, aid the adoption of new technologies and the adaptation of enterprises, and contribute to creative problem solving.

Martin Trow<sup>14</sup> has noted that "*a central problem for higher education policy in every modern society is how to sustain the diversity of institutions, including many of which are primarily teaching institutions without a significant research capacity, against the pressure for institutional drift toward a common model of the research university – the effort alone shapes the character of an institution to be something other than what it is – a prescription for frustration and discontent.*" He has identified four homogenising forces: institutional and personal ambitions; political lobbying on the part of new universities; advocates for social equity who present all differences in the resourcing of institutions as unfair; and bureaucratic preferences for uniform models of resource allocation. His observations appear to have universal applicability.

The problem of sustaining diversity deepens as resources for higher education become scarce, because research universities cost considerably more and they need a different funding base. As Robert Berdahl has explained: "*states can only afford a very limited number of research universities and not every institution that wants to be one can be and not every region that wants to have a research university can have one.*"<sup>15</sup> Not all rich universities are great, but there are few if any poor ones with rich academic programs and excellent research.

The stage is being reached in Australia, where the need is not to expand higher education institutions but to invest according to mission. Nothing is to be gained through a homogenous and uniform system. Nor does homogeneity and aspiration to sameness result in equality for institutions or students. It is the most distinguished universities that demonstrate to the world what the nation can achieve. They set the standard and provide the core research capability that underpins the quality of the nation's diversified network of higher learning institutions.

The ANU's special amalgam of Institute of Advanced Studies and Faculties, coupled with a culture that allows an intense focus on academic scholarship, makes it an invaluable resource for attracting leading researchers from all over the world to live and work in Australia.

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<sup>14</sup> Trow, M. (2003), "On Mass Higher Education and Institutional Diversity", in *University Education and Human Resources*, Technion-Israel Institute of Technology, Tel Aviv.

<sup>15</sup> Berdahl, R. M. (1998), "The Future of Flagship Universities". UC Berkeley.

Without the best academic leaders working at the forefronts of expanding knowledge, the relative geographic isolation would pose an almost insurmountable barrier for the Australian university community to participate and contribute to the most important intellectual and cultural advances to be made in the twenty-first century.

By extension, the existence of the ANU potentially benefits the entire system of higher education in Australia, with important cultural, economic, and technological spin-offs for the societies and industries of the greater Asia-Pacific Region. The rationale for special funding is thus as strong as when the ANU was founded fifty-eight years ago.

### **Government policy and financing for higher education and research**

However, the policy environment of the last 15 years or so would not necessarily point to that conclusion. Since the Dawkins' reforms of the mid 1980s, Australia's policy incentives for higher education and research have indeed largely promoted quantitative expansion, rather than qualitative improvement. Expansion of the system, while governments have been holding down costs to general taxpayers, has involved an increasing cost shift to students, a lowering of real resources per student and, despite the efforts of universities to find compensating income streams from other sources, a threat to quality. By way of illustration:

- Whereas in 1998-99 government grants represented over half the revenue of all universities, changes brought about by both Labor and Coalition governments has seen the public proportion on the decline: in 2002-03 they accounted for only 42% – the main source of income growth has been sales of educational services through tuition fees and charges, comprising 38% of revenue.
- The gap between the value of the indexation of grants for salary-related purposes, and actual cost rises, as measured by movements in the average weekly earnings series, has totalled over \$1 billion since 1995 when a Labor Government reduced the rate of indexation for salaries that the Coalition has continued to apply.
- University student to staff ratios have risen sharply: from 15.6 in 1996 to 20.8 in 2003, and continue to worsen.

Paradoxically, higher education is at once becoming financially deregulated and yet subject to increasingly intrusive procedural regulation. Changes to higher education financing policy in Australia have reflected a growing interest of governments in contestability and conditionality in many jurisdictions - not least the United Kingdom, whose policies have been influential in Australia.

Contestability seeks to obtain value for the purchaser by promoting competition among institutions. And Australian policies have displayed increasingly high conditionality – including through the growth of specific-purpose funding schemes, service-purchase agreements (involving matched funding requirements) and prioritisation via target-setting or the identification of areas of focus. Policy changes to take effect from 2005 involve partial fee deregulation for undergraduate students, and the formalisation of government relations with universities and other higher education institutions as

'providers' of purchased services, together with more restrictive funding conditions and tighter reporting requirements.

An important quid pro quo for this changing relationship between the university and the state, in the context of increasing exposure of higher education to market forces, has been the commitment of some \$1.6 billion additional outlays by the Australian Government to enable an expansion of access to higher education and an increase in the rate of funding per student. But the pressures remain.

In respect of research, similarly, the Government has significantly raised its own spending through *Backing Australia's Ability* and created incentives for building university-industry partnerships to stimulate national innovation. This level of public investment in research is set to continue through the first decade of the Twenty First Century on the basis of the commitments announced in 2004 in *Backing Australia's Ability 2*.

Understandably, from a public financing policy perspective, those additional outlays come with conditions attached. Nevertheless, from the perspective of the university there is a considerable opportunity cost associated with loss of university discretionary income through requirements to match unpredictable 'winnings' from competitive research schemes. The increasing atomisation of funding for research contrasts with the tendency of research problems, and indeed knowledge itself, to cross disciplinary boundaries and to require flexibility and integrative approaches to its understanding.

Of particular importance to this Review is the tendency to level the system by failing to identify, reward and promote points of quality differentiation. Important peaks of excellence are thereby flattened. By way of illustration:

- The distribution of funds for research and research training across all universities in Australia's 'national unified system' has, since the Dawkins expansion, been sourced not least from a 'clawback' of resources from the established research-intensive universities.
- Funds are allocated for research training places and research infrastructure through performance-based formulae comprising quantitative measures (such as income for research-related purposes) that are equally weighted irrespective of the quality of the inputs and outputs.

Further changes to policy settings for research are under consideration. In recent policy debates, some have proposed moving away from block funding for research altogether as an approach to public investment. The implications for the mission of ANU are concerning.

### **The internationalisation of higher education**

Australia's universities have long been involved in international collaboration through research, conferences, staff training and recruitment, staff and student exchanges, and development assistance programs. Since the late 1980s many Australian universities

have dramatically expanded their participation in the export of education services. International students at Australian universities grew from 18,200 in 1988 to 185,100 in 2002. Revenue from overseas fee-paying students had risen to around 12% of higher education system income by 2002, ranging from 23% in the case of a few universities to around 5% for some, including the ANU.

The demand for higher education is continuing to rise beyond the domestic supply capacity of many developing countries, notably in Asia. As a developed English-speaking nation in the Asia-Pacific region, Australia is well placed to contribute to meeting the demand. By so doing Australians are likely to benefit through the formation of business and diplomatic networks in the region as well as by the cultural diversification of students and curricula.

There are also indications that Australia's engagement to date is poorly strategised and possibly unsustainable. International students are enrolled in a narrow range of fields of study. They originate from relatively few source countries. There are indications of recent softening of demand from Australia's traditional source countries in South-East Asia.

A major challenge for Australia is to attract top quality undergraduate students and, increasingly, graduate students and those seeking professional development. Through its prestigious reputation and the excellence of its research and graduate training, the ANU can play a special role in that regard, and thereby assist the whole Australian system.

A further challenge is that of increasing the international learning experience of Australian students, noting that:

- whereas 14% of the tertiary student body in Australia comprises foreign students (second only after Switzerland), only 0.6% of Australian students are studying abroad – this imbalance in the international exchange of students limits the exposure of Australians to cultural diversity and the global business environment; and
- fewer than 1% of Australian university students are enrolled in courses to learn a language other than English – language competence is fundamental to the appreciation of cultural diversity and the ability to function as a global citizen. For the time being, English is the lingua franca for business and science, other languages are growing in terms of their representation on the Internet, and it is unwise to assume that those with only one language will have the greatest influence in world markets.

### **Evaluating quality performance and approaches to its assessment**

The liberalisation of trade in education services generally is giving rise to concerns among developing countries of protecting their students from sub-standard providers issuing qualifications that will not be useful for employment or further study. The growing international activity of Australian universities has increased the exposure of

Australian educational qualifications to external scrutiny by prospective students, foreign governments and employers of graduates. Increasing competition among education suppliers within countries, including Australia, is also leading to tighter domestic arrangements for accreditation and quality assurance.

It would not advantage ANU, nor any other Australian university, to be part of a system that did not assure at least minimum standards of quality of its educational qualifications. Neither would ANU benefit from a system of quality assurance, based on a simple assumption of parity of esteem of educational awards, that paid no regard to differences among institutions in the quality of their inputs, processes and outcomes.

With regard to research, the challenges are even more complicated. This review takes place at a time when the Australian Government has undertaken to explore ways of reflecting qualitative differences in the distribution of resources, particularly relating to research funding, and possibly involving some form of peer evaluation. The lessons of the British Research Assessment Exercise, now in a mature phase of iterated development, and this review of ANU, will likely be important in that process.

This Review is therefore highly relevant to the debate about the national policy lacunae, through the methods it has adopted, as well as for addressing the particular needs of ANU.

### **In summary, implications for ANU**

The traditional forms of demand for higher education in Australia are changing as the population ages. School leaver numbers are levelling out and are projected to decline in the region surrounding ANU over the next several decades. Competition among universities for the most able young students can be expected to intensify.

Future growth in domestic demand is likely to come mainly from the working age population seeking qualifications upgrading and professional development. Conventional, long-cycle and campus-based forms of provision may not be attractive to many in this group. New providers are likely to enter this market in diverse ways, offering more flexible and customised services. ANU has the advantage of its national capital location to develop top-shelf graduate programs to meet the professional development needs of public sector agencies and of organisations that interact with government.

International student demand to study in Australia for undergraduate education is also beginning to soften from traditional source countries. Competition for top quality students will be fierce in future. Strong growth in demand can be expected at graduate levels and for intensive professional development programs. Many new providers can be expected to enter this market. To be competitive, ANU will have to make use of its research intensity to design challenging programs for research-informed professionals, and so differentiate its offerings on the basis of quality.

Population ageing and associated social costs will continue to put pressure on public expenditures on education. Governments can be expected to continue to encourage

universities to become less dependent on public funding and to require demonstrable returns on the investments that they do make.

A danger in the drift of policy in respect of research is the temptation to achieve early outcomes by promoting short-termism and atomisation: by competitively allocating funds in small parcels each tied up with tight goals. Ironically, this is happening when fundamental knowledge itself, and the problems to which it is applied and from which it derives, is becoming more complex and holistic.

The University's performance is being achieved with resources well below those available to many of the world's top research universities. But the costs of doing leading-edge research are rising relentlessly. With growing levels of public investment in research-intensive universities in North America, Asia and Europe, ANU will be hard pressed to maintain its standing into the future without sufficient growth in its revenue base. The Australian community cannot afford to be complacent. There are no great universities that are poorly resourced. But ANU itself will also need to generate income in new ways.

In this changing context, we see ANU facing several challenges in:

- ensuring Australia plays at the leading edge in the global knowledge economy;
- balancing its service to the nation with an international reputation for excellence;
- sustaining depth through disciplinary specialisations, and promoting breadth through cross-disciplinary connections;
- diversifying its sources of revenue growth, and safeguarding academic values and integrity; and
- preserving support of basic research over the long-term perspective.

## **ANU Research in Comparative Perspective**

*"...the fundamental purposes and character of a research-intensive university [comprise] a commitment to building 'steeples of excellence' in research, learning and teaching; viewing the combination of teaching and research as what we are about, despite innumerable temptations; having the freedom to set agendas; seeking industry partnerships as enrichments to, not distractions from, the research process; maintaining porous boundaries; and being open to chance and serendipity in research."*<sup>16</sup>

### **Research and creative practice at ANU**

ANU is a research-intensive university. Around 85% of its expenditures and 73% of its academic staff effort are devoted to research. A powerful ethos of research enquiry permeates the whole University. The Faculties are highly competitive in winning national research grants. The University Centres receive special funding as national hubs of research expertise. Block funding for the Institute of Advanced Studies provides a capacity to undertake long-term and large-scale research that is exploratory and experimental. This combination of research capability gives the ANU its distinctive strength.

On several important measures of research quality ANU is the Australian leader – in membership of learned academies, percentage of staff with higher degrees, funded Fellowships, ARC Discovery grants per staff, and research expenditure per staff.

The information presented in the *ANU Capabilities and Performance Statement* regarding the quality of research comprises national comparative performance information, international peer assessments and bibliometric analyses.

There is no simple statistical measure of excellence in the performance of a major university. But it is possible to form a balanced judgement by adopting a diverse set of indicators – some qualitative others quantitative – that profile performance from complementary perspectives. This chapter of our Report takes just such a pluralist approach to establishing the international standing of ANU as a research-led university.

### **ANU research profile**

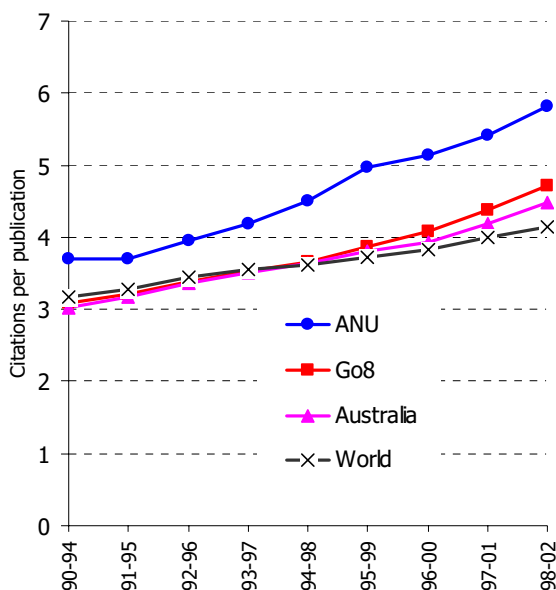
Bibliometric data indicate that ANU represents 3.7% of Australia's academic staff, and accounts for 7.7% of Australia's research publications. The ANU's citation per publication rate of 5.81 compares with an Australian average of 4.47, a Group of 8 average of 4.71 and a world average of 4.33. The overall quality of ANU research

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<sup>16</sup> Gerhard Casper, (1998), "The Advantage of the Research-Intensive University". Office of the President, Stanford University.

output is indicated by its impact of 1.34 relative to the world. Of particular note is the recent sharp upward trend from 1991-95 to 1998-2002 in the ANU's citation impact across most fields of research covered by ISI.

**Citations per publication, selected comparisons**



	No of Pubs	Cpp	Impact relative to World
<b>ANU</b>	<b>7464</b>	<b>5.81</b>	<b>1.34</b>
Go8	53460	4.71	1.09
Australia	97131	4.47	1.03
World	3454179	4.33	1.00

Source: The Australian National Citation Report, prepared by the Institute for Scientific Information® Inc. (ISI®, Philadelphia, Penn., USA: © Copyright Institute for Scientific Information 2002. All Rights Reserved.

The above graph of citations/publications shows that in the most recently available four year period, when compared with the average of the world's universities, all Australian universities have had a relatively greater impact of 3%, the Group of 8 (which includes ANU) have had a relatively greater impact of 9%, and ANU itself has had a relatively greater impact of 34%.

The funding stability and flexibility of the ANU enables the University to attract the people and devote extra effort to long-term and difficult research that makes a relatively high impact by top international measures.

## The quantity of scholarly output

Whilst quality of research is paramount, the quantity of high quality output is also an important consideration. Table 1 shows the number of research publications by type of publication and the number per full-time equivalent academic staff member for ANU, other group of 8 universities and Australian universities in total for 2002. Each ANU staff on average publishes 1.6 times more than Australian academics publish on average, and 1.3 times more than Go8 staff.

	FTE Academic Staff	Books Authored research	Book Chapters	Article in Scholarly Refereed Journal	Full Written Paper Refereed Proceedings	All publications	All Publications per FTE Academic Staff
UNSW	1,759	40.71	206.79	1,436.47	448	2,131.97	1.212
Sydney	2,030	39.33	219.18	1,821.09	336.94	2,416.54	1.190
Monash	2269	42.75	204.23	1,321.83	620.2	2,189.01	0.965
Melbourne	2,243	62.83	265.08	1834.23	441.29	2,603.43	1.161
Queensland	1,941	29.5	220.62	1,738.90	345.03	2,334.05	1.202
UWA	1063	25	104.42	952.36	230.5	1,312.28	1.235
Adelaide	929	13.5	78.63	1,010.15	158.87	1,261.15	1.358
Go7	12,234	253.62	1,298.95	10,115.03	2,580.83	14,248.43	1.165
<b>ANU</b>	<b>1160</b>	<b>68.67</b>	<b>333.6</b>	<b>1226.72</b>	<b>158.74</b>	<b>1787.73</b>	<b>1.541</b>
Go8	13,394	322.29	1,632.55	11,341.75	2,739.57	16,036.16	1.197
<i>Australia</i>	<i>30,998</i>	<i>554</i>	<i>2,890</i>	<i>19,037</i>	<i>7,044</i>	<i>29,525</i>	<i>0.953</i>

Source: AVCC, Summary of Unweighted Audited Publications Data by Category, 2002

Table 2 shows the relatively high quantity of published output of the IAS and University Centres. Overall, ANU produces 1.54 publications per staff member compared with 1.17 for the other Go8 universities and 0.93 for all other universities. ANU has double the Australian and Go8 average output of books and book chapters; these types of publication receive higher weightings in government resource allocation formulae, reflecting their generally more substantial, integrative and enduring contribution to knowledge.

	FTE Academic Staff	Books Authored research	Book Chapters	Article in Scholarly Refereed Journal	Full Written Paper Refereed Proceedings	All	All Publication per FTE Academic Staff
<b>ANU</b>	<b>1,160</b>	<b>69</b>	<b>334</b>	<b>1,227</b>	<b>159</b>	<b>1788</b>	<b>1.54</b>
Australia (net of ANU)	29,838	4853	2,556	17,810	6,885	27,737	0.93
Go8 net of ANU	12,234	254	1,2999	10,115	2,5818	14,248	1.17
ANU staff as % of all staff	3.8%						
ANU output as a % of Australian output net of ANU.		12.4%	13.1%	6.9%	0.02%	6.5%	
ANU output:*							
• Faculties		19.6	104.0	324.3	65.7	513.6	
• IAS & Centres		49.1	229.6	902.4	93.0	1274.1	
Publication profile: % of total output in a particular category							
• Australia		1.8%	9.2%	65.1%	24.8%		
• Go8 (net of ANU)		1.8%	9.1%	71.0%	18.0%		
• ANU		3.8%	18.7%	68.6%	8.8%		

Source: AVCC, Summary of Unweighted Publications Data by Category, 2002; \* ANU publications are the audited numbers found at [www.anu.edu.au/ro/data/2002statistics.php](http://www.anu.edu.au/ro/data/2002statistics.php). Staff numbers are drawn from Commonwealth department Education, Science and Training, *Selected Higher Education Statistics, Staff, 2002*.

### **The quality of scholarly output**

For the purposes of this review, ANU researchers were asked to identify their best five pieces of research, scholarship or creative work over the period 1995 - 2004. The primary classification of works was by field and discipline of research. The work of most researchers fell into a single disciplinary area but some classified their work into more than one discipline. The secondary classification of works was to the Faculty, Research School or University Centre to which staff are attached. Each Faculty or School thus had works submitted for assessment across a number of disciplinary areas.

Following nominations from ANU researchers, external peer assessors were appointed to cover the disciplinary specialisations used in the primary discipline. The assessors were asked, in May through July 2004, to rate the best five nominated works of some 90% of academic staff.

The assessors rated 67.8% of the ANU's research output submitted for assessment as being in the top 25% of research internationally and 29.2% in the top 5% internationally. For the IAS, the figures were 73.4% and 35.0%; for the Faculties, 61.4% and 20.9%; for the University Centres, 60.8% and 24.4%. More than 40% of assessors rated ANU as being in the top 25 universities in their field in the world. Table 3 presents the aggregated results of peer assessment by disciplinary areas.

### **The integrity of the data**

We wished to assure ourselves about the integrity of the data provided, which comprised:

- data derived mostly from official sources such as DEST, and all capable of volume comparisons within Australia;
- quality assessments based on international peer review ratings by disciplines indicating the proportion of work judged in the top 5% and top 25% internationally;
- summary assessments accompanied by narrative judgements and an international quality rating in tranches of "top 25", "top 50", "top 100" universities;
- citation analyses of bibliometric data;
- self-evaluation reports by academic units.

**Table 3: Peer Review Ratings by discipline and academic group**

Discipline	TOP 25%				TOP 5%				Papers (*)	Staff (**)	Asses s-ors (***)
	ANU	Fac	IAS	Centres	ANU	Fac	IAS	Centres			
Asian and Pacific Studies	<b>68.8</b>	62.3	73.1	62.1	<b>28.1</b>	21.1	32.5	21.9	746	216	25
Astronomy and Astrophysics	<b>75.3</b>	63.0	76.4	--	<b>41.3</b>	19.0	43.3	--	123	27	9
Australian Indigenous Studies	<b>62.6</b>	69.3	76.4	57.2	<b>33.5</b>	32.5	48.0	31.2	216	76	6
Biological Sciences	<b>68.1</b>	65.6	71.5	--	<b>23.8</b>	15.8	34.7	--	327	75	15
Biomedical Research	<b>60.7</b>	49.7	68.6	47.9	<b>27.8</b>	30.6	32.7	15.0	542	153	22
Business and Commerce	<b>53.2</b>	55.9	--	37.4	<b>18.3</b>	20.1	--	7.9	175	48	9
Chemical Sciences	<b>71.1</b>	60.0	78.8	49.9	<b>31.4</b>	22.4	37.7	13.4	306	75	21
Earth Sciences	<b>63.5</b>	53.0	68.9	--	<b>19.1</b>	10.8	23.3	--	369	103	6
Economics	<b>55.1</b>	64.3	53.1	48.2	<b>23.6</b>	32.8	21.7	16.4	419	118	15
Environmental Research	<b>48.4</b>	45.9	51.3	48.8	<b>14.0</b>	10.1	17.6	20.1	205	62	11
History and Archaeology	<b>75.3</b>	71.4	78.2	75.6	<b>33.2</b>	21.4	39.3	40.6	487	147	20
Information Sciences and Engineering	<b>63.3</b>	43.2	75.7	24.0	<b>32.6</b>	16.1	42.8	0.0	371	114	9
Language and Culture	<b>75.2</b>	70.8	87.2	83.2	<b>27.8</b>	25.7	49.9	28.6	471	176	24
Law	<b>62.6</b>	61.4	64.1	70.0	<b>20.9</b>	17.0	25.8	55.0	437	173	12
Mathematical Sciences	<b>83.8</b>	74.5	89.3	72.8	<b>37.5</b>	31.1	42.6	18.5	250	62	9
Philosophy	<b>89.2</b>	80.0	94.0	--	<b>62.1</b>	20.0	84.0	--	129	34	2
Physical Sciences	<b>83.9</b>	85.6	84.2	62.6	<b>42.5</b>	41.0	43.0	26.7	560	133	17
Policy and Political Sciences	<b>70.4</b>	46.2	76.8	68.5	<b>26.6</b>	6.7	31.8	25.2	438	130	13
Psychology and Mental Health	<b>55.8</b>	52.0	54.8	64.6	<b>21.8</b>	17.2	30.0	28.7	186	50	7
Studies in Human Society	<b>63.1</b>	57.7	68.4	55.2	<b>32.6</b>	26.1	39.5	22.3	600	184	18
Visual Arts	<b>67.0</b>	67.0	--	--	<b>8.0</b>	8.0	--	--	62	26	3
<b>ANU OVERALL RATINGS</b>	<b>67.8</b>	<b>61.4</b>	<b>73.4</b>	<b>60.8</b>	<b>29.2</b>	<b>20.9</b>	<b>35.0</b>	<b>24.4</b>			

The University Centres vary in their scale and the scope of their activities, from small focused units, such as the Centre for Mental Health Research or the Centre for Aboriginal Economic Policy Research, to larger and more comprehensive units, such as the Asia-Pacific School of Economics and Government, or the Humanities Research Centre.

(\*) Total number of papers available for assessment (up to 5 per researcher over the period 1995-2004).

(\*\*) Some staff contributed work to more than one discipline

As might be expected, the data do reflect some of the weaknesses that result from peer assessment: in particular, an uneven spread of assessors, and individual differences of interpretation of the criteria between assessors. The instructions from the University could have been more precise, and disparities among assessments may have been reduced by having the individual views of assessors integrated by subject coordinators.

Deficiencies in bibliometric assessments are also well known:

- variable relevance between different disciplines with different modes of publication;
- the international dominance of citations by topics of interest to North American and European researchers;
- known inadequacies of accurate institutional identification in the sampling procedures;
- research counts based on institutional affiliation that do not account adequately for recent staff arrivals;
- the complications of quality assessment of certain expressions of academic endeavour, e.g. policy advising and performance
- the issues specific to ANU of the impossibility of mapping all discipline-defined data onto specified academic units; and
- a tendency for assessors to inflate their ratings within a discipline when not making comparative adjudications between disciplines.

However, the extensive dataset allowed analysis of the convergence of different types of assessment, compensating for possible deficiency in any particular element. With only a few exceptions, the data presented from different sources were statistically well correlated.

As might be expected, not all areas of ANU are superb. However, it is remarkable that over 80% of those who rated the publications of philosophers in the Institute of Advanced Studies (IAS) believed them to be in the top 5% in the world. Other high ranking areas of the IAS that had over 40% of their publications ranked in the top 5% were Astronomy and Astrophysics, Australian Indigenous Studies, Information Sciences and Engineering, Languages and Culture, Mathematical Sciences, and Physical Sciences.

This shows impressive breadth and strength, and is one justification of the block grant support of the IAS over time. Additional comments on strengths are found below.

### ***Moderation panel***

With regard to the reliability of the data deriving from the external peer evaluations, Professor Knowles reported a reasonable degree of confidence at a sufficiently aggregated level of analysis – for disciplinary groupings and academic units:

*I think that the primary assessment data are as good as they could reasonably have been. One can always wish for more (for example, having more than one assessor even in a small sub-discipline), but considering the problems of availability and compliance of nearly three hundred international reviewers, the data are both more extensive and more carefully analyzed than I had expected.*

*We examined the average number of publications submitted and their distribution across the faculty, as well as the number of publications a given assessor was expected to review. There was some variation in the latter, but we felt that this would mostly affect the more fine-grained assessment of particular sub-disciplines, rather than the holistic view of the ANU. As is true everywhere, the lack of robust citation data in the Humanities, and the higher fragmentation of this division into small sub-fields, makes the assessment of particular sub-fields less secure. But – given the academic landscape – I think the assessments that have been assembled are as good as they reasonably can be.*

Professor Knowles also advised the Vice-Chancellor of the calibre and independence of assessors. He came to a most positive impression of ANU research:

*Overall, and assessing the ANU as the premier institution of higher education in Australia, there is no doubt that – even though it is sui generis (in having been founded as a collective of research schools that has developed and grown into a University that contributes directly to the education of undergraduates) – by all accepted international standards, the ANU is a distinguished, attractive, and impressive institution of which Australia must be proud. The assessment exercise that you have generated has been undertaken with care and independence, and essentially all the metrics confirmed for us that the ANU is very highly regarded, even when measured against the best institutions of higher learning, world-wide. We examined the assessment methodology with some care, and found that the home institutions of the assessors (both in Australia and abroad) are mostly of the first rank, that an appropriately high proportion of the assessors (85%) were from outside Australia, and that the final weighted averages of research and scholarship by discipline deemed to fall into the top two "world-class" categories (of "Exceptionally Significant" and "Internationally Excellent") is impressively high. In terms, therefore, of an overall view of your University, we found an enviably high standard.*

We come to a similar finding.

### **Areas of particular strength**

In almost every disciplinary area of research, ANU has at least half of its assessed output within the top 25% of world research. In some areas – ranging across philosophy, mathematical sciences, physical sciences chemical sciences, astronomy, biological sciences, Asian and Pacific studies, language and culture, history and archaeology, visual arts, policy and political sciences, and international relations – more than two thirds of research has been assessed within the top 25%.

Another way of interpreting the results of the research assessment undertaken for this review is to compare the number of pieces of internationally excellent work (i.e., judged by eminent external assessors to be in the top 25% in the world) to the number of researchers. An institution or field can reasonably be defined as attaining sustained

international excellence where there are at least as many pieces of internationally excellent work as there are researchers.

As Table 4 shows the University meets this standard in all 21 fields and that across the University (and in 15 of the 21 fields), there are more than twice as many pieces of internationally excellent research as there are researchers. In four fields, Astronomy and Astrophysics, Mathematical Sciences, Philosophy, and Physical Sciences, there are three times as many pieces of internationally excellent research as there are researchers. Given that researchers were limited to submitting five pieces each, it is unlikely that these results reflect the efforts of only a prolific minority. Rather, the aggregated results suggest that the majority of ANU researchers, across the Faculties as well as the Research Schools and University Centres, are performing at high quality standards.

**Table 4: Number of works rated in top 25% internationally per ANU Researcher**

<b>Research works in the Top 25% of works worldwide</b>	<b>Submitted Papers</b>	<b>Participating Staff</b>	<b>Expected Result*</b>	<b>Actual Result</b>	<b>Actual to Expected Outcome ratio</b>
<b>Discipline</b>					
Asian and Pacific Studies	746	216	29.0	68.8	2.38
Astronomy and Astrophysics	123	27	22.0	75.3	3.43
Australian Indigenous Studies	216	76	35.2	62.6	1.78
Biological Sciences	327	75	22.9	68.1	2.97
Biomedical Research	542	153	28.2	60.7	2.15
Business and Commerce	175	48	27.4	53.2	1.94
Chemical Sciences	306	75	24.5	71.1	2.90
Earth Sciences	369	103	27.9	63.5	2.27
Economics	419	118	28.2	55.1	1.96
Environmental Research	205	62	30.2	48.4	1.60
History and Archaeology	487	147	30.2	75.3	2.49
Info. Sciences and Engineering	371	114	30.7	63.3	2.06
Language and Culture	471	176	37.4	75.2	2.01
Law	437	173	39.6	62.6	1.58
Mathematical Sciences	250	62	24.8	83.8	3.38
Philosophy	129	34	26.4	89.2	3.38
Physical Sciences	560	133	23.8	83.9	3.53
Policy and Political Sciences	438	130	29.7	70.4	2.37
Psychology and Mental Health	186	50	26.9	55.8	2.08
Studies in Human Society	600	184	30.7	63.1	2.06
Visual Arts	62	26	41.9	67	1.60

\*1 work per researcher on average assessed as being in top 25% of world research in the discipline

We formed the view that the strong performance of the Institute of Advanced Studies, in particular, is both commendable and expected. Indeed, the performance of the

Institute may have been understated by the restriction of five works per researcher assessed. Whereas the Faculties are producing excellent research, the distinguishing feature of the Institute's performance, as noted above, is its considerable volume of excellent research.

The assessor ratings and bibliometric analyses by discipline are reported in the *ANU Capabilities and Performance Statement*. We do not second guess those assessments. As indicated above, we appreciate how the assessments were made and we are satisfied that the data paint an independent and acceptably consistent picture on the broad canvas.

We also found the qualitative comments of assessors illuminating. A selection of assessor comments accordingly is included to indicate the general regard in which the ANU is held by academic peers, noting that we are able only to quote comments in ways that do not disclose the identity of assessors or individual researchers.

A minority of assessors, some 6 per cent overall, made negative comments without any offsetting positive remarks, about the works presented for assessments and the performance of some areas. One assessor remarked, "*This once highly recognised department is in a rather emaciated state and needs considerable support to return to its former status. I have real concerns for the future of the discipline as it stands in the faculties at ANU.*" Another assessor said, "*My main concern is that there seems to be somewhat of a quality gap between the full professors and the early and mid-career faculty members (with some notable exceptions).*" And another remarked, "*Works are fundamentally competent but not esp. pathbreaking or world class; topics are narrow and theoretical contributions are limited.*"

A further 15 per cent of assessors had a mix of positive and negative comments. For example, of one area an assessor said, "*The publication record reflects a broad philosophy of quality vs quantity- in other words there are not in general very many papers produced, although some are of particularly high quality. Of course there should be no encouragement to lower publication quality but nevertheless there could be more papers.*" Of another, it was said, "*The group is trying to do something truly ambitious – develop tools for integrated environmental assessment. Such work is by its nature rather 'applied' and does not lend itself readily to standard evaluations of scientific quality. My ratings of the proportion of work that is 'world class' may be skewed toward the low end because of this.*" And another assessor remarked: "*The research is primarily policy oriented. It is clearly work of considerable significance to Australia. Some of the issues and lessons would have relevance elsewhere but the researchers emphasise (understandably) the crucial importance of careful contextualisation. In other words they are not driven by a desire to create broad generic models or to undertake international comparative studies.*"

However, on the whole (79 per cent), the assessors' comments were unqualifiedly positive. Our various meetings, visits and discussions gave us the opportunity to form more nuanced impressions of ANU research in several fields. We discuss some of the major areas below.

### ***Physical sciences***

Several members of our team gave considered attention to the quality of research performance in their own fields of expertise. For example, the plasma physics group at ANU is pursuing several highly innovative research projects including applications as diverse as semiconductor device fabrication and rocket propulsion. A major emphasis is plasma science for thermonuclear fusion, not through the more conventional approach of tokamak machines but through stellarators. External assessors of ANU research supported these observations.

- Of Atomic and Molecular Optics (AMO) Physics in the Research School of Physical Sciences and Engineering, an assessor said: *"I would rank this work within the top 2% in world research. ANU researchers have made exceptional significant contributions to AMO, making Australia to one of the leading countries in AMO research."*
- Of quantum and atom optics in the Department of Physics, it was said: *"The research is of very high quality. In particular the research on continuous variable quantum systems...has produced many outstanding publications both in experiment as well as in theory."*
- Of Nuclear and Particle Physics, an assessor remarked: *"Another striking feature to come out of this evaluation of publications is the coherence of the research program at ANU. The researchers cover the most important issues in contemporary nuclear physics in the vicinity of the Coulomb barrier. They do so by utilising an impressive array of experimental techniques. They also seem to always find a way to carry out pioneering experiments at the home laboratory, and then take advantage of unique capabilities available elsewhere to complement and expand the breath of their work. The frequent access they have to other facilities around the world, where pressure on beam time and equipment is often considerable, is another testimony to the scientific excellence of the research program at ANU."*
- Of non-linear optics and Photonics at RSPSE, it was said: *"This School is without question one of the best places in the world in the field of nonlinear photonics; arguably the very best in the sub-field of optical solitons."*

The research topics of the inorganic chemistry groups at the Research School of Chemistry (RSC) cover a broad range of very high standard fundamental research. The School also has strengths in synthetic organic chemistry. The creative work in supramolecular chemistry and the approach to chemo-enzymatic synthesis are at the forefront of new developments internationally.

Important areas of biological and structural chemistry are being investigated, reflecting the growing importance of organic chemistry to biological problems. The ANU has some of the world's leading researchers in physical and analytical chemistry – working on colloids and interfaces, solar energy, electron diffraction and x-ray diffuse scattering. Similarly, the theoretical and computational chemistry group at RSC is regarded as one of the best in the world.

Committee members were also impressed by the work being done by the Research School of Astronomy and Astrophysics (RSAA). This group is regarded as the leader in optical and infrared astronomy in the Asia region. Its finding of the dark-energy content of the universe was rated as the "discovery of the year" in 2001 by *Science* magazine. Similarly, the innovative MACHO project led to the first detection of microlensing, and contributed understanding of the dark-matter content of the universe.

Similarly, Geosciences at ANU is notable for publications in a high-impact set of journals and a citation rate over 50% above the world average. The research School of Earth Sciences, with strengths in geophysics and geochemistry (see box) has an even higher impact.

- An assessor said of the Research School of Astronomy and Astrophysics: "*The RSAA research group has produced an astonishing fraction of the most important papers in astronomy and astrophysics in the last decade.*"
- Of Statistics research of the Mathematical Sciences Institute it was said: "*this is an outstanding group, clearly one of the world leaders and some very promising young researchers.*" Of Analysis in MSI it was said: "*All of this constitutes research in Analysis at the highest level world-wide.... absolutely outstanding by any standards. Y is regarded as one of the great young geniuses in analysis.*"
- Of Geochemistry in the Research School of Earth Sciences, an assessor said: "*In my opinion, the overall quality of research in geochemistry in the RSES is unsurpassed in the world, and equalled at only a handful of institutions. Internationally, the visibility of the School in the field of geochemistry derives in part from its rich and distinguished history. However, there is much more to the present stature of the group than reputation alone. Collectively, they are as vital and productive as ever, and remain true leaders in the field of geochemistry.*"
- An assessor of artificial intelligence and signal processing in the Research School of Information Sciences and Engineering said: "*I regard this as an excellent group. The Department of Systems Engineering in particular has a long-standing worldwide reputation...Just outstanding. I wish we had such a group in [my country]*".

### ***Biological, biomedical and health-related sciences***

Health-related research at ANU is both very successful and important on national and international levels. The John Curtin School performs an impressive array of basic research and is highly regarded as a place of excellence. The new state-of-the-art building for the John Curtin School, now under construction, should provide the necessary laboratory and other research space for continuing to attract excellent research staff and graduate students. The Mental Health Centre is an international resource for community-based epidemiological studies of mental health problems. Staff are afforded national and international acclamation regularly. The National Centre for Epidemiology and Population Health is internationally known for its path-breaking studies.

In the biological sciences, we benefited from the independent assessment of Dr Rita Colwell, an external member of the Committee. She noted ANU's particular strengths in plant sciences, genomics, photosynthesis and invertebrate and cell biology. She commented:

*The strong interactions between legal research, neurosciences, and the physical sciences at ANU are critically important in the world of interdisciplinary science of the twenty-first century. The plant and animal sciences stand out at ANU in all measures.*

*In summary, the biological sciences are healthy and strong at ANU. Plant and animal sciences, molecular biology, ecology, and evolution, as well as biochemistry and biotechnology are all strong, internationally recognised, and proving an excellent investment by the Australian Government*

Assessor comments confirmed that general view in specific areas of research.

- Of biochemistry and cell biology in the Faculty of Science, an assessor commented: *"the teaching commitments of staff make goals with long time horizons difficult. It is remarkable therefore that the fraction of highest quality science is impressive."*
- Of neuroscience and vision at the Research School of Biological Sciences, it was said: *"The RSBS continues to enjoy an excellent reputation in neuroscience and vision research and by the indicators provided here that tradition can continue into the future. It continues to be an outstanding research resource for Australia and the world."*
- Of Genetics and Gene Regulation at the John Curtin School of Medical Research, it was said: *"The JCSMR has world class components and a strong history. Of particular note are the Phenome Project and the efforts of the Immunology group. The history of the organization, the outstanding founding members and the current mixture of diverse and focused efforts add up to an overall impressive group"... "If ANU groups are assessed through the number and ranking of publications, they certainly enter the top 50 and face other large and powerful universities. But in their particular situation, the ANU groups will survive only if they keep an original way of doing science and preparing students. From the orientations recently taken and from the blend of subjects and renewed intellectual interests, it appears that colleagues take this challenge very seriously. In this respect I believe that the ANU groups express more originality than some other very powerful universities in the world. Although this is a very intuitive appreciation, the originality of the ANU groups places them among « my » top 25. This is supported by the interest expressed by students from abroad to carry on Ph. D. studies and postdoctoral research in ANU laboratories."*
- Of the National Centre for Epidemiology and Population Health research it was said: *"NCEPH is playing a key international role in developing a research and policy agenda which addresses the issues likely to dominate public health in the 21<sup>st</sup> century. For example, the group's researchers are at the leading edge of work on the interface between population health and sustainable development, the epidemiology of infectious disease, and health transitions in the Asia-Pacific region."*

- Of the Centre for Mental Health Research, it was said: *"Without doubt, this is a first rate Centre carrying out excellent work, that often exerts an exceptional impact on international research progress."*
- Of research on genes, ecology and evolution in the Faculty of Science, it was said: *"This group, within the Department of Botany and Zoology, has evidently decided to develop strength in a few areas, rather than trying to spread itself over the vast field of evolution, ecology, and genetics. The result has been outstanding representation into major areas, systematics and behavioral ecology, in which there is especially significant research on the application of molecular phylogenetics to understand the evolution of chromosomes, reproductive biology, geographical distributions, and other characteristics; and on the evolution of social organisation and breeding systems in birds and other animals. Smaller research groups are also pursuing important research on several other topics."*
- Of plant sciences at the Research School of Biological Sciences, it was said: *"The RSBS has one of the greatest collections of scientists with complementary expertise for research in photosynthesis. Their work is usually at the forefront of the field... RSBS ranks among the top academic units worldwide that carry out first class plant science research."*
- Of plant sciences in the Faculty of Science, an assessor commented: *"I was very impressed. Since these faculty members have a substantial teaching load, in comparison to their colleagues at RSBS, I had thought that their productivity might not be as good. However, at least from my sampling, they have generated several important studies. It is clear that the Faculty of Science has some very productive and creative young and mid-career scientists. But there are some impressive senior scientists as well who are maintaining a strong research profile."*

### **Social Sciences**

ANU is strong in the social sciences as it is in the natural sciences. Indeed, in the social sciences, the range of departments and special emphases in the IAS, Faculties and Centres has unique assets. The assessment data point to a highly productive group of researchers on the cutting edge of their disciplinary or multidisciplinary perspectives.

We did note some variation in the assessment of quality in some areas of social sciences research. The external peer assessors, similarly, gave wider variations to their ratings of the Social Sciences than to the Physical Sciences and the Humanities. This is to be expected, to some extent, in more value-contested areas of research and scholarship. For instance, the 1988 Review of the Research School of Social Sciences commented on the different stances among researchers in the discipline of Economics:

*"To members of other social sciences, economists often seem to have a 'party line', a confidence in an intellectual tradition that enables them to claim competence over a wide field and which leads them to neglect alternative perspectives. Economists themselves are proud of the relative 'hardness' of their discipline but they give more emphasis to variations within their membership. What seems highly theoretical to some people is regarded by economists as 'applied' work; what seems narrowly 'economic' to others might be regarded by most economists as policy analysis and not 'economics' at all. In recent years, in many countries, there has been a resurgence of emphasis on price as a means of conveying information and on the importance of individual responses to information relative to policy or centralised decision making. Those economists who continue to be concerned with the principal issues of the 1960s may well be regarded by their younger colleagues as having retired from economics."<sup>17</sup>*

We believe the variation in some fields – including Economics – also reflects ANU's highly distributed support of these research fields across Research Schools, Centres and Faculties, with their various sub-disciplinary and/or geographic specialisations. Another factor explaining the variation is the strong and intentional focus on policy questions of relevance to the Asia-Pacific region, including of course, Australia. This policy focus has possibly contributed to a lower level of international academic visibility of ANU research in the Social Sciences than is warranted. We discuss this matter further below.

Assessor comments indicate an impressive spread of research strengths.

- Of resource management research in the Centre for Resource and Environmental Studies, an assessor said: *"I am highly impressed by the quality of research produced by the Centre for Resource and Environmental Studies, especially in terms of spatial analysis of environmental data, biodiversity, and water resource management."*
- Of demographic research in the Centre for Aboriginal Economic Policy Research, it was said: *"The Centre for Aboriginal Economic Policy Research has an established reputation as a strategic, quality research program that is well situated in the nexus between policy, research and practice."* *"It is the leading national research program in this field and an exemplar to research centres with an indigenous research focus."*
- Of economic theory research in the Faculty of Economics, it was said: *"Collectively this is a world class research group. One is amongst the most prolific publishers in the top five journals - he would be hired by any department in the world. A further two are leading world authorities in their fields and publish regularly in the world's top mainstream journals and leading field journals. The youngest member of the group also does excellent work that is published in top field journals and lesser mainstream journals."*

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<sup>17</sup> Report of the Review Committee on the Research School of Social Sciences, August 1988, chaired by Professor Donald Stokes, Princeton.

- Of applied economics in the Research School of Pacific and Asia Studies, it was said, *"There is no comparable group of experts on Asian economies anywhere in the world. There is not another school in the US or the UK that comes even close. A few Japanese institutions can match ANU in numbers who do applied work on Asia, but they do not match up in terms of economic rigour."* Of research in Asia-Pacific Economics in the Asia-Pacific School of Economics and Government, an assessor said: *"I have been particularly impressed by the work on Japan, which is of exceptionally good quality and has significant impact on the international debate."*

It is to be expected that the ANU has research strengths in Pacific-rim economies and politics. Indeed, work on development economics and trade is most distinguished. So too is the work on comparative government and politics, and international security, strategic studies and international political economy. The Review Committee was impressed by the inter-disciplinary approach of ANU researchers to work on the South Pacific. Research relating to China in the Contemporary China Centre and the Research School of Pacific and Asia Studies is highly regarded.

- Of international relations research in the Research School of Pacific and Asia Studies, it was said: *"The Department demonstrates a strong showing in international theory.... The department demonstrates strength in both international security and international political economy the two leading sub-fields in International Relations." ... "The Department also shows strength in less traversed but equally important topics, such as the environment, indigenous rights and human rights more generally. I conclude that the Department of International Relations is an excellent department that has benefited from recent hires in international theory, to complement its already strong showing in research on the Asia-Pacific region."*
- Of research in political theory it was said: *"The research of the scholars at the ANU is, in quality, on at least a par with virtually every world class university with strength in political theory. The top four or five scholars would not outrank the top four or five at many universities (e.g., Harvard, Oxford, Yale, Princeton, Berkeley). But the average is better than any of these."*
- Of philosophy research in the Research School of Social Sciences, it was said: *"Most significant, perhaps, is the extraordinary quality of the central work of a very large number of RSSH's philosophy faculty. This group quite clearly deserves its standing among the top 12-15 programs in philosophy in the world, and would be higher were it larger. In a number of subdisciplines in philosophy – notably philosophy of mind and cognitive science, ethics and meta-ethics, philosophy of biology, metaphysics – it is, as it stands, one of the top half dozen departments in the world. It shows high productivity and high visibility, as well as high excitement – this is field-leading, dynamic work that has also made ANU a magnet for foreign scholars, and ANU faculty a regular target for raiding by top universities."*

Academic staff of the Faculty of Law have produced important books and articles (in a variety of journals), and two of Australia's leading law reviews – the Federal Law Review and the Australian Yearbook of International Law. The research activities in the Faculty are strengthened and complemented by the research undertaken in the Research School of Social Sciences; and the relationship between the Faculty and the Research School is valuable. The law of intellectual property, administrative law and public international law are areas that have achieved prominence in research in both institutions.

- Of research in law in the Research School of Social Sciences and the Faculty of Law, it was said: "*The Law and Society group at ANU is internationally recognised as the best centre for the study of regulatory theory and evidence-based studies of regulation in the world. The collection of researchers gathered together is unparalleled, as is the production of high quality scholarship.*" "*Although I know this is a first rate group, I was very impressed to look over the long list of scholars involved in the group, and to scan their collected work. There is an enormous amount going on in this group, and a very nice balance of basic scholarly work and policy-relevant efforts.*"

### ***Humanities and the Arts***

We were uniformly impressed by the quality of Humanities research at ANU. The Humanities Research Centre and the Centre for Cross Cultural Research have an outstanding record of achievement, and a high international reputation, attracting the world's top scholars. The Australian National Dictionary Centre, the National Europe Centre and others, have become sites for a new focus on trans-disciplinary collaboration. The Faculty of Arts also impressed us as a lively and creative group among whom are many leading scholars in Anthropology, Archaeology, History, Literature, Linguistics Arts Criticism, and Cultural Studies. The Creative Arts are of particular interest. External assessors' comments reflect similarly positive impressions.

- Of socio-cultural anthropology in the Centre for Cross-Cultural Research, assessors said: "*This is a very productive group...with some of the world's leading scholars in the area and very original*"... "*Under its current leadership the Centre for Cross Cultural Research has achieved an extraordinary level of quality across the board. Its senior researchers are genuine international leaders, and their work has attracted and enabled a group of emerging researchers whose outputs are immensely promising and already comparable with research at an international level*"... "*The Centre has been highly innovative in encompassing and creating new media and forms of dissemination, and it has made major – and often groundbreaking – contributions elucidating indigenous cultures, colonial histories, art and aesthetics, and most particularly advancing the field of visual anthropology. Its national role as a facilitator of cross-cultural understanding is politically vital, as well as intellectually illuminating.*"

- Of anthropology in the Faculty of Arts, it was said: *"The anthropology group in the Faculty of Arts would rate 5\*, the highest category, achieved by only 2 out of 20 anthropology departments in England and Wales."* Of research in literature in the Humanities Research Centre and the Centre for Cross Cultural Research, it was said: *"First of all I want to say that the HRC and the CCR are in my view two of the finest research outfits in the world. I could say much more, but it is largely and widely known that the HRC is a destination for some of the world's finest talent, and that it is revered in the Anglophone academy as one of the finest research institutions."* Of research in Literature of the Faculty of Arts, it was said: *"My sense of the works I already knew (several), and the ones I was able to access in an afternoon in the ... Library stacks, is that none are inferior and most are of impressively high quality. There are books and articles here on particular authors and major literary topics that ought clearly to be a part of any scholar's understanding of those subjects. Many of these scholars have been invited to contribute to the new wave of "companions" and such that have become de rigueur for major humanities publishers over the course of the period surveyed here."*
- Of linguistics in the Research School of Pacific and Asia Studies, it was said: *"(A) is, without any question, a world leader at the very top of his field. The work of (B&C) is consistently in the top 5% of scholars worldwide --- the ANU is justifiably proud to have scholars of their calibre and productivity. This unit is responsible for the preparation and publication of volumes in the Pacific Linguistics series. PL is by far the largest and most important publication outlet for work on the languages of the Pacific and island Southeast Asia, and libraries around the world know about the ANU through these volumes."*

## **Matters for consideration**

On the basis of our own observations and the comments of assessors, we note two matters worthy of further discussion within the University:

- the publication of research outputs, and
- the integration of research endeavours.

### ***The publication of research***

Several assessors, outside the natural sciences, commented on the low proportion of publications appearing in the leading international journals in their fields. Some also commented that research conducted for practical national policy purposes is not always conceptually or methodologically ground-breaking.

- *"I covered all the works of five individuals in my field of expertise. All the work was good or very good, but not always published in the best places. Some was in the form of non-refereed reports published by international agencies, or book chapters readable in style but repeating old work or somewhat unpolished. That said, the best output is truly outstanding."*
- *"Relatively few of the publications of these researchers were found to be available at one of the world's most well-stocked English-language university libraries. This discovery suggests that the dissemination of these researchers' writings might be more limited than need be the case."*
- *"I was surprised by the amount of edited book and contribution type material being produced...The listings (of works) did not give evidence of many breakthrough or theoretically significant pieces of research."*
- *"...almost none of the submitted work represents a major methodological breakthrough in economics. As a result none of it appears in the very top economics journals."*

In our view, the role of ANU in supporting research and scholarship on matters of national importance to Australia is no less important today, and is unlikely to be less important tomorrow, than it was when ANU was founded in 1946. However, in some fields of academic endeavour, research directed extensively towards solving Australian problems, no matter how important and excellent, may not readily achieve the international visibility and impact that is now expected generally of leading researchers. We note that the 1988 Review of the Research School of Social Sciences enjoined the School to "mount research that is directed towards major social or national needs and towards the deepest questions of understanding."

While Australian universities have special responsibilities for Australian citizens, they also have responsibilities to increase knowledge for the world. Clearly, Australian research is

now able to stand alongside the best in the world and there is no reason for any continuing cultural cringe.

While publication rates are high in comparison to other universities in Australia, the variation in responses from the assessors indicates that still more effort needs to be placed, in some units, on publishing in internationally recognised journals. In many cases, the research at ANU, such as applied economics, is regionally focused and may have little interest to the US researchers who dominate English language publications in economics. Thus it can be difficult for even the best economists working with a strong focus on Australian problems to publish in the top-ranking journals.

Meeting the challenge of publication in internationally esteemed journals may well help address the second concern raised by some assessors, regarding the conceptual or methodological approaches to research. We place high value on public policy research and the positive impact it can make, even when it is not highly theorised. Nevertheless, in our view, research is undertaken in the setting of a university so that it can form part of the international academic discourse, as well as help apply solutions to local problems. Research that is concerned with only the latter, no matter how competent, does not naturally fit within a university that aims to stand among the great institutions of the world.

### ***The integration of research endeavours***

Collaboration between the Faculties, Centres and Research Schools has yielded positive research outcomes for the ANU in many areas – including mathematical, physical and chemical sciences, and in law, anthropology, archaeology and linguistics. Conversely, competition and duplication between the IAS, Faculties and Centres may impede the realisation of ANU's potential. In several areas, the 'National Institutes' initiative has been working to reduce duplication, and increase collaboration in research and education at ANU. They enable more strategic and coordinated activities internally, and help present ANU in a more integrated way externally.

Economics research spreads across at least seven different units of the University, providing the ANU with a notably large and diverse group of economists. Yet the strength of Economics research was assessed to be variable and did not achieve, on the whole, at expected levels of performance. There is a need to focus research in Economics and improve collaboration among the academic units, to increase impact and bring the multiplicity of perspectives to more students, both undergraduate and postgraduate.

The Mathematical Sciences Institute (MSI) is a particularly interesting formation. Structurally it is unique within ANU. It straddles the Institute, the Faculties and Centres through joint appointments, and achieves a potent concentration of expertise. Its research outputs received ratings among the highest reported for the University.

While the Review Committee noted a close working relationship between the Faculty of Engineering and Information Technology and the Research School of Information Sciences and Engineering, the reported ratings of research were more variable than

expected. On investigation, members of the Faculties in Information Sciences were convinced that the expertise of their reviewers did not map well onto the publications submitted for review. That said, consideration might be given to a tighter relationship between the two academic areas, along the lines of MSI.

Similarly, ANU has clear strengths in areas of environmental research but they spread across several small academic units. They appear to lack sufficient critical mass to make the outstanding impact that is needed, and of which it is capable, to help address national and international problems. Consolidation and improved coordination is required.

Scope also exists for improvement in the interdisciplinary collaboration and cross Research School and Centre linkages in the medical and health sciences. The academic units appear to function quite autonomously and do not connect with others as closely as they might. Students could clearly benefit from introductions to multiple perspectives. The academic units themselves could become even more competitive for external funding by collaborating.

Following the recent opening of the Medical School, there is a major opportunity to develop the way research is done in other settings. Relying on the Faculties and the Institute to teach many of the basic courses to medical students is an exceptional initiative that could reduce the kind of duplication found in other research universities.

Moreover, ANU has the potential to advance the exciting possibility of greater interface between the 'hard' and 'soft' sciences; and where cross-disciplinary analysis can yield particularly valuable outcomes for complex issues, such as effective water management.

What is plain, however, is that ANU has notably strong research performance in several of the Humanities disciplines, even if this too is fragmented across the ANU. It is timely to develop a research school for the Humanities to complement those for the Sciences and Social Sciences. The National Institute of the Humanities does facilitate virtual links, and offers a firm basis for further development.

One area we commend to ANU to develop more systematically is the study of religion as a civil force in relation to global developments. For instance, it is increasingly important for the West to better understand the diversity of Islam across nations, and within them on the basis of age and gender and socio-economic condition, in the interests of enabling dialogue that builds cooperation rather than conflict. ANU is particularly well placed to contribute in this regard, given its strengths in languages, area and culture studies, international politics, law and Islamic studies.

## **Research Training at ANU**

*An urgently necessary work...is to explore the means of bringing the various essential kinds of specialist knowledge and training into effective relation with informed general intelligence, humane culture, social consequence and political will.<sup>18</sup>*

### **The critical importance of quality research training**

Research-intensive universities make two major contributions: they produce, preserve and disseminate knowledge; and they develop people with the capabilities for producing and interpreting knowledge. The latter is the focus of this section of our report.

The preparation of highly trained researchers is increasingly recognised around the world as an essential element of innovative economies and democratic societies. The awarding of research higher degrees remains, in most countries, a function that only universities perform. At the same time, the purpose of research training now extends beyond that of preparing future academic generations and encompasses all the evidence-informed professions.

Research students are crucially important in universities in general. Admission to research degree programs is highly selective and successful completion requires unusual personal dedication and hard work. The capacity to provide quality research training environments that are simultaneously demanding and supportive, is necessarily limited within nations. Only those universities with the combinations of expertise, infrastructure and a culture of aspiring to excellence fostering leading-edge research, can provide high quality research training.

The quality of research training in a nation is measured by the quality that its best universities provide. The research-led university is ideally placed to perform that duty. Most top-level professional training should take place in our highest quality academic environments.

### **The scale of research training at ANU**

The role of ANU in research training has been growing since the 1995 Review of the Institute of Advanced Studies, with about 1700 research students (1519 full-time equivalent) presently enrolled. Since 2002, the university has set a growth target of an additional 100 research students (full-time equivalent) per year, with an expanded scholarship program to attract first class Honours applicants. This growth represents a significant effort on the part of the ANU in recent years.

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<sup>18</sup> F.R. Leavis, (1979). *Education and the University*. Cambridge University Press. New York

Nonetheless, across ANU there is, on average, only one higher degree research student (FTE) per research-active academic staff member – the same average ratio for all Australian universities. The ratio is less than one in several of the most distinguished research performing areas of the University. Higher degree research student load has grown by only 4% per annum on average over the last decade, and most of the growth has been in international students. ANU clearly has potential for greater expansion in the area of research training. Important areas of research strength are significantly under-represented in terms of higher degree research student numbers.

By the standards of the world's leading research universities one could at least expect ANU, given the capacity enabled by its block grant, to have some three times as many research students as it currently enrolls. Of course, having the capacity to supply research training opportunities is only one side of the coin. There also needs to be sufficient student demand across the categories of supply. Yet that is rarely achieved, as students tend to present in greater concentrations for some fields of research than for others. In the latter categories, ANU will need to encourage its undergraduate students to continue through to higher degree research studies.

If Australian Government policy continues to limit growth in domestic research enrolments and to lack incentives to enable the best students to attend the best universities, avenues must be explored for increasing the number of international research students. ANU should devise financial strategies to create further scholarships for cross-subsidising the support of an expanding cohort of post-graduate students.

In this regard, ANU could develop a more strategic approach to the establishment and award of postgraduate scholarships, both for research training and postgraduate coursework students. (This matter is further discussed later in the report).

### **The quality of research training**

The Review Committee considered various indirect indicators of quality, such as the attainment levels of applicants, student satisfaction surveys and focus group reports, completion rates and student destinations.

The data suggest to us that the quality of ANU research training is of a consistently high standard. For example, ANU graduates report a commendably strong level of satisfaction with intellectual climate and infrastructure. An independent report of focus group discussions with students also indicated that "most PhD students believe that they are personally receiving a high quality research experience at the ANU":

*The main reasons for PhD students' satisfaction relate to supervision, their departments' research environment and resources. Those highly satisfied report having supervisors who are accessible and interested, and who take an appropriate mentoring role. They also report being in a department with a strong research culture. And, as mentioned previously, many PhD students feel that considerable resources are available to them, including equipment, support services or research funding. While most PhD students are happy with these aspects, a small minority feels that the quality of their research experience is not*

*meeting their expectations. Their main issues relate to perceptions of insufficient supervisor interest or insufficient interaction within the research department.<sup>19</sup>*

Committee members also had the opportunity to meet with some students and supervisors, and to observe some of the actual settings for research training. By way of illustration, the Research School of Physical Science and Engineering informed us that most post-graduate students visit laboratories in other universities, mainly outside Australia, to gain perspective, knowledge, and to interact on a world-wide basis. Students were also seen rebuilding a complex apparatus in need of repair, and conducting their doctoral research using state-of-the-art equipment. From our experience of research training, this approach of combining theory and practice, though not unique to ANU, develops a commendably broad knowledge base and confidence for graduate students.

Similarly in Law, research activity has benefited from the different emphases in the Faculty and the Research School of Social Sciences, allowing for variation and adaptability in the face of new demands and challenges in law. In terms of research training, Law is the beneficiary of research intensity in the two institutions. There is the interdisciplinary potential, a number of international and national visitors, excellent electronic provision, a well-organised library (combined with access to the National Library and the Library of the High Court), a growing post-doctoral presence, the location of Law in the national capital, and a long-standing commitment to research.

### **The management of research training**

Research training is a University-wide endeavour – over half the University's doctoral candidates are enrolled in the Faculties and increasing numbers in the IAS. The research training environment in individual Schools, Faculties and Centres of ANU provides the home base for research students; it is complemented by a University-wide Graduate School with special programs as well as support from other central areas like the Academic Skills and Learning Centre and the Division of Information. ANU has recently sought to strengthen and make more consistent the quality of research student experience, introducing a Code of Practice for Research Supervision, and commencing a program of supervisor registration and training.

ANU's system of supervisory panels provides students with access to research expertise wherever it is located, on or off campus. This is especially important for interdisciplinary and multidisciplinary research topics, where a single supervisor and department model does not provide full coverage of relevant fields.

The management of research training has over the last few years undergone a variety of changes. While ANU has been adopting best practice in many aspects of research training, the roles of the Graduate School, and of Schools, Faculties and Centres, in managing the recruitment, supervision, administration and progression of research students have been fluid and perhaps unclear. This is compounded by the structural

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<sup>19</sup> ANOP Research Services, (2004), "Student Group Discussions on the Quality of their Education at the ANU".

complexity of ANU in general, with the Schools of the IAS, the Faculties, and the Centres all operating with a large degree of autonomy in the area of research training.

The University could move to adopt a stronger process for the strategic management of research training. As with the management of research in general at ANU, despite great strength in the area in individual Faculties and Centres, there is an absence of focus for research training in the humanities that might be afforded by the establishment of a Research School for the Humanities.

## ***Students and Education at ANU***

*The ecology of the university depends on a deep and abiding understanding that inquiry, investigation and discovery are the heart of the enterprise, whether in funded research projects or in undergraduate classrooms or in graduate apprenticeships. Everyone at a university should be a discoverer, a learner. ... Unfortunately, universities are often archipelagos of intellectual pursuit rather than integrated communities.<sup>20</sup>*

### **Educational aims of ANU**

ANU is clear in its aim to provide education that is grounded in its research activity. Indeed, it is the level of research intensity, unique among Australian universities, that ANU seeks to make the basis for a unique set of degrees and courses:

*The ANU is a teaching and research university; but it is different from many others. It has a degree of research intensiveness that makes it unique within Australia. This provides the ANU with the opportunity to develop educational programs that draw from a distinctive campus culture – a pervasive culture of curiosity.*

*Students of the ANU can be exposed to programs that draw their content from the edges of knowledge in a field that is revealed, not eventually from remote authors, but by the work of practitioners on the same campus. Students can attend seminars and workshops given by these staff, and be influenced by them, even though they might have no formal contact with them as teachers.<sup>21</sup>*

We found evidence of this aspiration across the University's community of teachers, researchers and students. Results of the 2003 Australia-wide survey of graduates' experiences (the Course Experience Questionnaire or CEQ) on the 'intellectual motivation' scale (e.g. 'the course developed my confidence to develop new ideas'; 'I found my studies intellectually stimulating'; 'University stimulated my enthusiasm for further learning') showed ANU to score higher than other Australian universities. (see table 5).

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<sup>20</sup> The Boyer Commission on Educating Undergraduates in the Research University, *Reinventing Undergraduate Education: A Blueprint for America's Research Universities*, (1998) p.9

<sup>21</sup> ANU Capabilities and Performance Statement (2004), p.4-1

**Table 5: Percentage of students 'agreeing' or 'strongly agreeing' with the items on the intellectual stimulation scale at ANU and nationally for the 2003 CEQ.**

Field of Education	Percentage ANU 'agree'	Number	Percentage national 'agree'	Number
<b>All undergraduates</b>	75.1	1281	70.9	92776
<b>Arts and Humanities</b>	82.4	337	79.7	8766
<b>Asian Languages</b>	81.6	35	77.7	494
<b>Creative and Performing Arts</b>	72.1	51	72.8	2643
<b>Economics and Commerce</b>	68.8	311	66.4	16573
<b>Engineering and IT</b>	67.6	122	62.2	11084
<b>Law</b>	69.4	134	75.3	2884
<b>Science</b>	79.2	284	76.9	12083

There is no doubt that the drive towards placing research at the heart of ANU education is real, and that it is absolutely the right path for ANU. The University has moved a considerable way along this path, but there is much further progress to be made.

ANU acknowledges this. The substance of its own self-assessment of education was a progress report on the implementation of a Review of Undergraduate Education conducted in 2002. Many practical measures recommended by that review have been implemented, and there is evidence that the educational culture of the University has begun to change – a not inconsiderable achievement in itself. The goal of a research-led educational experience for all ANU students is very clear, even if it is yet to be fully achieved.

Equally, there is some danger in taking too narrow a definition of "research-led education". This should not prescribe theoretical learning at the expense of practical and experiential; nor should it hinder the University's provision of professional education, in particular the opportunity to make a significant contribution to the nation through providing professional education to the workforce of the national capital.

### **Student quality**

The quality of the student body of a university is an important ingredient of the quality of learning, because students learn from one another as well as from their teachers. Individual students who ask searching questions or bring fresh perspective enliven and add value to the educational process for all learners. Around the world, the proportion of the available pool of intellectually talented young people that is attracted to a university is a signal of its prestige. A distinguishing characteristic of Australia's Group

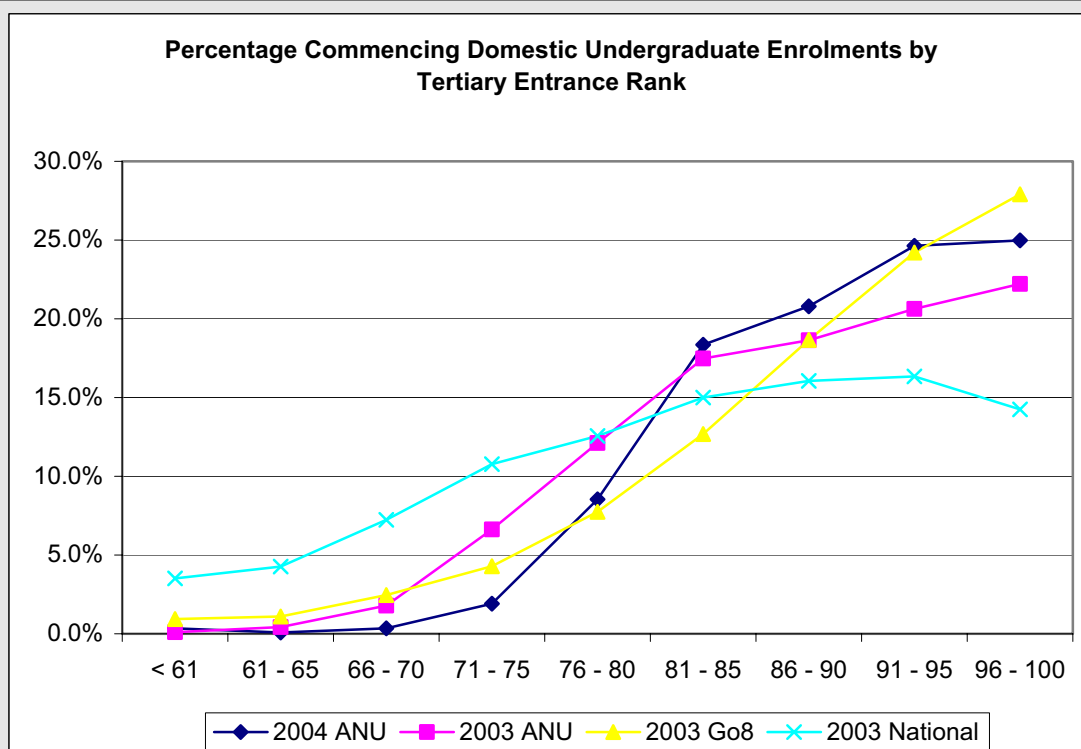
of Eight universities is that they admit over half of their domestic undergraduate commencing students from among the most academically able of the school leaving cohort each year.

A related indicator of student input quality is the proportion of university commencing students who have achieved in the top band of all students. The entry cut-off scores for most ANU courses exceed the 85<sup>th</sup> percentile of the Universities Admission Index (UAI). Those cut-off scores, that determine the minimum standard of attainment necessary to be offered a place, have been moving progressively upwards from a UAI score of 70 in 2000. The boxed graph below shows the change in the quality of students admitted to ANU and other Go8 Universities.

**Outcomes to 2004: entry scores**

The goal to increase the number of ANU students with high Tertiary Entry Rank was adopted in the strategic plan *ANU to 2005*, and identified as a primary indicator of the success of the enhancement of undergraduate education at the University. This was not simply to maintain the “prestige of an ANU degree”. If ANU is to genuinely offer academically intensive research-based degree programs, fairness demands that entry to these programs needs to be offered only those students with realistic expectations of success.

In the two years since the Review, ANU has demonstrated an upturn in Tertiary Entry Rank of incoming students. TER scores are well above national averages, and – as of 2004 – better than the Group of Eight University average in all but the very highest band.



The above figure gives the percentage all incoming students in each TER band. Data are given for all Australian universities and for the Group of Eight universities (2003), and for ANU in 2003 and 2004.

ANU is increasingly attracting a comparatively high proportion of its students from the most able students presenting for enrolment. A highly competitive environment of intra-state demand for top students is also emerging, and ANU will certainly need to perform well in that context.

### **International student quality**

The Committee became aware, during the course of the review, of concerns about the quality of international students being attracted generally to study in Australia. We wished to assure ourselves that ANU had adequate policy mechanisms in place and was applying them for the purpose of safeguarding quality in admissions and educational standards.

We were advised that the University has a policy of requiring at least the same admissions standards for international students as for Australian students. Additionally, international students must demonstrate a specified level of English language proficiency. The University's Guidelines stipulate that all undergraduate students must meet admission requirements that conform to the schedules promulgated by the University Admission Centre (UAC). That Centre publishes approved equivalences for international qualifications and these are applied to international students. Where an appropriate UAC equivalence is not available, the University develops its own equivalence based on the best local and international information available to it. Locally developed equivalences are approved by the University's Admissions Standards Committee. All undergraduate admission requirements are subject to review annually and follow variations in the previous year's University Admissions Index.

International graduate students are admitted by an assessment of prior learning which is also based on the best practice and relies heavily on guidelines published by, for example the Australian National Office of Overseas Skills Recognition or the United Kingdom National Recognition Information Centre. Coupled with stringently applied English language requirements, the University's admissions requirements are generally conservative.

The performance of undergraduate international students is monitored annually and students at risk (two or more failures) are identified and counselled. Graduate students are subject to annual review. Monitoring has identified a particular cohort of international students at risk - those entering the University through the local school system - and the University is now working with Faculties and the local education department to develop prerequisites for admission. A study of grade distributions over the period 1998 to 2003 indicates comparability between international and local students at High Distinction level, roughly 5% less at Distinction and Credit level respectively; roughly 10% more at Pass and 5% more at Fail.

ANU has been a relatively cautious participant in the business of international education, and through its marketing, selection of agents and screening of students and institutions, has worked purposefully to safeguard the international credibility of its

qualifications. For example, ANU confines its cooperative ventures to only those institutions ranked among the top 10% in their home countries. The University also ensures that its partners, and its alliances with them, comply with all relevant local and international legal requirements.

But in one area did the Committee have some cause for concern. The National Graduate School of Management (NGSM) offers Masters degree programs in Mandarin as well as English. Its admission criteria require a high-quality university degree plus at least three years of work experience. It was not made clear to us how the University ensures equivalence across ANU Masters programs in business-related studies in respect of standards for academic entry and award course completion.

### Assessing the quality of education

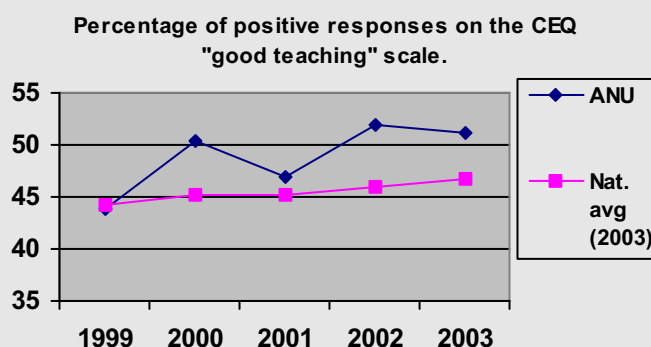
It is notoriously difficult to evaluate the quality of teaching and learning in absolute terms. In addition there are no easy ways of making meaningful comparisons between Australian universities about excellence of teaching or the academic standards achieved by students. By contrast, in the UK, for instance, such direct evaluation is possible through the Teaching Quality Assessment process of the 1990s, and the comprehensive external examiner system.

Currently, Australia relies for its evaluation of educational quality on a number of indirect indicators of education quality, such as student satisfaction surveys, student progress rates, program entry scores, and graduate destinations. The most widely used indicator of students' satisfaction is the Course Experience Questionnaire. This indicator is used by the federal government to assess educational quality. It is a major component of the commercially published 'Good Universities Guide', which compares Australian universities.

The boxed graph below shows ANU scores compared with the national average, for 2003.

#### Outcomes to 2004: teaching quality

The National Course Experience Questionnaire given to all graduates of Australian universities, the ANU scores above the national average on the "good teaching" scale:



ANU performs more than respectably on all the available measures.

In its strategic plan, ANU aspires to:

*equip its graduates with the attributes and skills that will enable them to take their place among their peers from the world's top universities; ANU degrees and diplomas will thus draw from, and be based on, high internationally-benchmarked levels of scholarship.*

To confirm its success in translating research performance into excellent research-led education, ANU may wish in the future to develop reciprocal arrangements with similar international universities, explicitly to benchmark the quality of its education.

### **Research-led education**

There is one higher degree research student for every six undergraduate students at ANU, compared with a ratio of 1:9 for other Go8 universities and 1:15 for all Australian universities. ANU is structurally advantaged to offer a quality research-led education that cannot be replicated by any other Australian university.

ANU offers undergraduate and taught post-graduate courses in many of the disciplines in which it conducts world-class research. In the main, these are delivered by the seven Faculties: Arts, Science, Engineering and Information Technology; Economics and Commerce; Law, Asian Studies, and the ANU Medical School. Some research schools and centres offer taught postgraduate programs in their own right.

As a result, there are significant areas of research strength at ANU that are not reflected in the undergraduate curriculum. A notable example is in the area of research that is focused regionally on the Pacific and Oceania. While there is no doubt that ANU conducts a significant amount of the world's leading research in this area, it is barely encountered by undergraduates studying the humanities, social sciences, and relevant science disciplines such as environmental science.

It is beyond the scale of this report to identify all such opportunities for the development of undergraduate courses drawing on the research strengths of ANU. However, we would encourage the ANU to conduct such an analysis on the basis of the findings of this review, in particular the location of these research strengths. Some areas suggest themselves immediately. For instance, ANU conducts a diverse range of research in economics, spread over seven different areas of the University, while the undergraduate teaching of the subject is confined to just one of these. ANU justifiably identifies its research contribution in the area of public policy as one of its distinctive features, but this is not so evident in the University's provision of undergraduate and taught postgraduate courses. Finally, there is no Research School for the Humanities, and as a result ANU itself seems less than fully aware of its research strength in the arts, culture

and humanities. While several faculties offer courses in areas such as language studies, linguistics, anthropology, sociology and political science, taking a more consolidated view of the research strengths in these areas across the University as a whole may have benefit to the strength and distinctiveness of these undergraduate programs.

Each Faculty has developed links with its corresponding research schools and university centres, all making valued contributions to teaching; some of these links are formal, while most are informal.<sup>22</sup> There seems, however, to be considerable variability in the scale and strength of such collaboration across the University. It is clear that a new leadership has been coming into place and is generally driving forward a program of renewal and diversification. At the same time, there was evidence of non-uniform commitment to, and emphasis on, the effort to collaborate, although much of the University was well aware of the importance of such engagement.

In its 2002 internal review of undergraduate education, ANU recommended that it:

*Establish more consistent rules (for financial, human and physical resources) for the offering of programs and courses between Faculties, the Institute of Advanced Studies, University Centres, and, possibly in time, National Institutes.*

We would support and strengthen that recommendation. In particular we note the potential role of the National Institutes to foster educational collaboration between the IAS, Faculties and Centres.

A further mechanism to develop the research basis of ANU education would be to adopt greater flexibility in the movement of staff and students between the Research Schools, Centres, and Faculties. While these organisations must of necessity remain discrete in terms of structure and purpose, there is no reason why the people who make up the ANU academic community need to remain within a particular island in the "archipelago of intellectual pursuit". Greater movement of staff to, from and between Research Schools, Centres and Faculties, and in particular, greater involvement of graduate students from the Research Schools in the teaching activity of the Faculties, could make more genuine and widespread the basis of ANU education in its research culture.

ANU has introduced a number of initiatives that form the flagship of its program to embed genuine research in its teaching programs. The PhB degree program permits a small number of extremely high-performing undergraduates to undertake self-directed, research-based studies under individual supervision as early as their first year. This is a worthy initiative for such students, however it does little to address the need for *all* ANU undergraduates to receive a research-led education, if that is to be one of the distinctive qualities of the University's education. Indeed, there is some evidence from student

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<sup>22</sup> These collaborations seem most clear where there is a direct correspondence between Faculties or Departments and corresponding Research Schools, such as in the Sciences, Engineering and Information Technology, Asian Studies and Law. The introduction of a Research School for the Humanities would facilitate collaboration with the Faculty of Arts, while some focus to the research in the disciplines of Economics and Commerce (currently spread among six Research Schools and Centres) would similarly assist educational collaboration with that Faculty.

focus groups to suggest that the existence of the PhB actually undermines the confidence of students following mainstream programs that their education is grounded in cutting-edge research.

In 2001, ANU introduced the 'iLearning' initiative which flagged certain courses – available to all undergraduates studying in that field – as being particularly focused on the development of research skills, critical reasoning, and being grounded in real research activity. This has led to the development of a number of such courses, but perhaps more significantly has led to a greater adoption by the academic community as a whole of such principles underlying education at ANU. This awareness is spreading organically, as is required for real change of culture.

We note that the proportion of students undertaking double degree combinations at the undergraduate level is high in comparison to other Australian universities. This may be regarded as a strength for ANU but it may also be a signal that students are looking for more flexible course choices. Breadth of learning combined with depth of study can be achieved through various arrangements. Parallel specialisations through double-degree combinations is but one way, having an attraction for students through the granting of cross-credits that allow shorter completion times than for the two programs taken separately. Another way of catering to student needs is through broader choices in early years followed by later specialisation. There appear to be few such options available to ANU students.

The PhB initiative has helped purposefully to integrate education within the research culture of ANU. Further steps could be taken along a road to truly distinctive undergraduate education, with crossroads to postgraduate studies and higher degree research. Indeed, we see scope for ANU to be proactive in the development of research-led education for all its students. This is its special potential within the Australian higher education system.

### **Professional education**

ANU offers programs that are professional in orientation – Law, Engineering, various programs in Commerce, and the newly introduced Medicine degree being examples. Evidence ranging from graduate destinations, student experience questionnaires and stakeholder surveys confirms that these ANU professional degrees are widely respected in the professions nationally and internationally.

Some students and staff perceive a tension between the aims of these programs and the fundamental research focus of ANU as a whole. In our view this tension is unnecessary. Taking a broad view of "research-led education", which seeks to develop students' ability to think independently, reason critically, discover and assess the value of evidence, it is clear that such attributes are valuable equally for students intending professional and research careers. Good examples are afforded in the social sciences, in which research-based methods, approaches and thinking styles in areas such as economics, public policy and health are as important to the professional practitioner as to the academic. ANU should seek to define the aims of its existing programs more

clearly so as to resolve this tension of perception, and seek to introduce new programs – particularly postgraduate coursework programs – that build on the synergy between fundamental and professional education.

ANU also provides a relatively small number of high-quality internships and other experience-based learning opportunities for its undergraduates. This is an area in which it has the potential to expand. Nationally and internationally, experiential learning is increasingly seen to be an essential element of higher education qualifications, by students, employers and many academics.

The last decade has seen an astonishing upward trend in the number of students returning to university to undertake postgraduate coursework studies.

The Committee noted the increase in numbers occurring in the coursework postgraduate area. Table 6 shows that since 2001, the number of Masters by Coursework students has outstripped the growth of any other postgraduate programs, doubling in enrolments since that time.

**Table 6 ANU Student Enrolments by Program Type at 31 March – 2001-2003**

<b>Program Career</b>	<b>Program Type</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Higher Degree Research	Doctorate by Research	1155	1222	1366
	Master's by Research	87	85	87
<b>Higher Degree Research Total</b>		<b>1242</b>	<b>1307</b>	<b>1453</b>
Postgraduate Coursework	Doctorate by Coursework		6	4
	Master's by Coursework	763	956	1347
	GradDip/PostgradDip - New	578	617	776
	Graduate Certificate	21	63	102
	Postgrad Qualifying or Prelim			1
	Cross-Institution - Postgraduate		2	9
<b>Postgraduate Coursework Total</b>		<b>1362</b>	<b>1644</b>	<b>2239</b>
Undergraduate		7065	7872	8292
<b>Grand Total</b>		<b>9669</b>	<b>10823</b>	<b>11984</b>

The large majority of such students are mature-age students who study part-time while in full- or part-time employment. The majority of qualifications sought are at least partly professional in orientation.

ANU has yet fully to capitalise on the demand for postgraduate coursework education, in particular for those postgraduates seeking professional development. Student feedback suggests that ANU could do more administratively to accommodate the needs of students studying part-time. Indeed, the fact that students are both studying and working creates difficulties and tensions. However, it also provides educational opportunities for the integration of work and learning that are not yet being fully realised in the University's courses.

We note that ANU is conducting a review of postgraduate education in the second half of 2004. That review presents an opportunity to address further the matters we have raised.

## ***Service and the Community***

*"Serving society is only one of higher education's functions, but it is surely among the most important. At a time when the nation has its full share of difficulties, therefore, the question is not whether universities should concern themselves with society's problems but whether they are discharging this responsibility as well as they should."<sup>23</sup>*

### **ANU Service**

The Review Committee noted the wide range of ways and means by which ANU contributes to national and regional development. As well as the important contributions it makes through research, scholarship and teaching, these services include:

- National centres that bring together academic members with other persons for conferences and seminars;
- The participation of ANU staff on boards and committees of major national institutions and local community organisations;
- Provision of evidence to tribunals and committees of enquiry;
- Commentary in the public media on topics of community interest and policy debate;
- Consulting services to national and international government and non-government agencies;
- Community use of ANU facilities for gatherings, performances, exhibitions and sports events; and
- Specific education programs conducted for young people and for adults.

#### ***Special Centres at ANU***

- *The ANU Centre for Actuarial Research*
- *The Asia Pacific College of Diplomacy*
- *The Australian Centre for Regulatory Economics*
- *The Australian National Centre for Audit and Assurance Research*
- *The Australian National Dictionary Centre*
- *The Australian Primary Health Care Research Facility*
- *The E-mental Health Centre*
- *The International Centre of Excellence in Asia-Pacific Studies*
- *The National Europe Centre*
- *The National Judicial College of Australia*

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<sup>23</sup> Derek Bok, (1990), *Universities and the Future of America*. Duke University Press. Durham and London.

ANU hosts the Australian node of the World Bank *Global Development Learning Network* (GDLN). Many ANU researchers are involved in the work of international bodies, such as the United Nations, the World Bank, the International Monetary Fund, the Asian Development Bank, and the World Health Organisation.

We saw several smaller scale examples where ANU researchers had initiated or helped local or regional companies to develop or produce products based on science and technology. The largest such example of interacting with other universities and society at large, is the creation of the National Information and Communications Technology Australia (NICTA). Coming out of a concept developed at ANU, the Prime Minister committed \$130 million which was matched by \$80 million by the University of New South Wales, the ANU, the New South Wales Government, and the ACT Government. This sizable interaction, that involves several members of the ANU faculty and has provided substantial scholarship support for ANU students, should bolster Australian efforts in this very important area for the next decade at least. This is an important example of ANU's contribution to industry and to Australia.

On the basis of our own observations, the evidence presented to us and the discussions we had with some of the people whose organisations make use of ANU services, we find that ANU contributions are substantive and highly regarded. Persons external to the University, who make use of its services, indicated increasing responsiveness of the ANU to their varying needs. But they ask, properly, to be assured that the nation is obtaining a good return on its investment in ANU.

In an environment of increasing competition for scarce public resources, the University has no choice but to make clearly visible, to multiple constituencies, what it does, how well it does it, and what difference it makes. This includes demonstrating its diverse contributions to economic, cultural and community development.

### **ANU contribution to public policy**

In our view, as a national centre of expertise located in Australia's capital, ANU has the capabilities and opportunities to make a more concerted contribution to public policy formation and debate. Without question, contributions are being made, and ANU staff in various ways impact significantly on the development of policies across an impressive range of areas, including: international relations and strategic defence; macro-economic settings; trade and industry development; population, immigration and human settlement; labour markets and productivity incentives; welfare support systems and social inclusion strategies; environment protection, water conservation and alternative energy technologies; public health; judicial and regulatory reform; and reform of public administration.

In 2003, ANU and/or ANU research was mentioned in more than 10,000 newspaper articles and on more than 4,000 occasions on radio or television. During 2003, ANU hosted 70 major public lectures, and conducted hundreds of less formal public lectures and briefing sessions.

Yet we gained an impression that many of these contributions appear to be often disparate and disconnected, and frequently ad hoc reactions to events or driven by personal relationships. This is not to say that coordinated events do not occur. They surely do. There are, for instance, occasional workshops among foreign embassy personnel and ANU researchers from various fields, to exchange information and discuss developments in the Asia-Pacific region. Although the recently formed National Institutes have made some headway towards coordinating ANU's capacity, and simplifying its presentation to the outside world, there is no integrating centre within the University in respect of public policy advising. We were surprised not to find an ANU publication for the evaluation of Australian public policy. There is no evident total commitment of ANU to public policy service. It seems to us that the potential for a great synergy of contributions from the multiple perspectives that ANU is uniquely able to offer is yet to be realised.

We recognise that the matters we raise will not be easy for ANU to address. The devolved character of the ANU is a source of its strength. Responsive academic contributions to public policy could well be hindered rather than enabled through attempts to harness them. Critical evaluations of either Government or Opposition policies are *ipso facto* not universally appreciated, and the ANU has a high level of dependency on Government funding. Nevertheless, the basic question is how, not whether, to address these challenges.

Of course, these are not entirely new challenges for ANU. The principles of academic freedom were well tested during the Cold War and again during the Vietnam War. ANU leaders have understood that "the government paid the bills; and however much [the Prime Minister] might defend academic freedom against parliamentary snipers...if put to the test, the government's definition of freedom would be measured."<sup>24</sup> ANU's various networks of influence, through both formal and informal channels, have been and will continue to be important in safeguarding the University against improper external intervention. Hence, it is critical for ANU to make its capacities known and available. It is equally necessary that the University performs its community service functions in ways that are wholly consistent with academic integrity.

### **Engaging with the national capital**

We have earlier made several observations about the potential for education at ANU to draw on the professional activities and aspirations of its students and graduates. The location of the ANU in the national capital provides a distinctive set of opportunities in this area. Canberra is characterised by a highly-educated workforce; the proximity of the Federal Government, national institutions, and a variety of policy-making bodies; an increasing amount of high-technology industries; and a number of cultural institutions, archives and libraries of national and international significance. The potential exists for ANU to make more of the educational opportunities afforded by this context.

The Committee that reviewed the research School of Social Sciences in 1978 considered that "rather more might be done to capitalise on the national role and national

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<sup>24</sup> Foster, S.G., and Varghese. M.M. (1996) *The Making of the Australian National University*. Allen & Unwin. (p. 123).

location.”<sup>25</sup> The 1988 Review of the same School urged ANU to “exploit its distinctive location, mandate, resources and ability to attract academic personnel of the highest calibre by mounting social science research of great importance for the Commonwealth of Australia.”<sup>26</sup>

The benefits of closer engagement would flow in both directions. The University could seek to provide distinctive experiences for its students through involvement in the policy, political, cultural and archival resources of the city as a whole. ANU could also devise a set of precisely-tailored courses and programs that meet the particular needs of the capital, including the Australian Public Service and its various agencies, the Parliament, and various advocacy bodies. It thereby supports and influences the current and future decision-makers of the nation.

To that end, the University should give consideration to increasing its engagement through the formation of external advisory groups or boards to provide perspectives on the future development of undergraduate programs, professional development programs and graduate courses, research orientations and research commercialisation.

A normative feature of modern universities, reflecting the development of knowledge in broader social contexts, is the purposeful formation of two-way relationships of people and ideas. Universities can learn much through the dynamic interactions they have with outsiders they bring inside. The experiences are beneficial too in breaking down misconceptions about the functioning of universities.

ANU is specially placed to develop links with other national institutions based in the national capital. ANU and the National Library of Australia together hold the majority of Asian language materials located in Australian institutions. Their joint management of the largest collection of Chinese language materials in the Southern Hemisphere as a single collection exemplifies what can be achieved. In another sphere, ANU’s National Institute of Bioscience collaborates with Qwestacon in developing interactive learning materials for young people all over Australia, thus encouraging interest in science. More generally, other national institutions are having to transform themselves as ‘learning organisations’ and to network internationally. ANU has much to contribute to their transformation as well as much to gain from their expertise and connections.

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<sup>25</sup> Report of the Committee of Review of the Research School of Social Sciences, August 1988, chaired by Professor Donald Stokes. Princeton.

<sup>26</sup> Report of the Committee of Review of the Research School of Social Sciences, August 1978, chaired by Professor Clark Kerr. Berkeley.

## ***The Funding Challenge***

ANU is a distinctive institution within the Australian higher education system. A key aspect of that distinctiveness in mission and operation relates to its funding.

Alone among Australian universities it receives a significant block grant (\$152 million in 2004) directly from the Federal government.

Unlike the UK and several other nations, Australia does not have an independent, national council for allocating funds, nor for advising on the allocation of funds, for higher education. The 'grant' is thus authorised by the responsible Minister, pursuant to legislation and on advice from the Ministry. Significantly, ANU sits alongside other public research agencies, who likewise receive a direct block of funding: CSIRO, ANSTO, AIMS and DSTO –to name the leading national institutions. Without direct funding they could not carry out their respective missions.

**Table 7: National Research Agencies Funding**

<b>Institution</b>	<b>2004-05 (\$m)</b>	<b>2005-06 (\$m)</b>	<b>2006-07 (\$m)</b>
Commonwealth Scientific and Industrial Research Organisation	546.5	555.4	563.6
Australian Institute of Marine Science	22.5	22.9	23.4
Australian Nuclear Science and Technology Organisation	108.0	110.2	112.4
Defence Science and Technology Organisation	286.7	n.a	n.a

Source: Australian Government Budget Papers, 2004-05

These publicly funded research institutions generate a growing proportion of their income outside their block grant, with some setting ambitious targets for commercial services and/or research contracts. While remaining 'public agencies', they have evolved to be hybrid-funded institutions. They are measured by government against, and stridently assert the scale of, their self-generated resources.

### **ANU operating budget**

In respect of the ANU, it is important to recognise the importance of both its block grant reliance and its self-generated income. Both are critical for its future as a high quality research-led university in an increasingly competitive global environment for higher education.

The current funding base of ANU relies on diverse income sources tapped at various levels of the University, sharing a hybrid resource base with Australia's other public universities. But ANU is more distinctive and complex in its special mix of funding. To its research mission has been added a modest undergraduate student load, which generates formula funding for its students. In addition, it has of course a post-graduate student research allocation from the Australian Government, which has grown significantly since the 1995 Review. The IAS has recently been able to compete for national competitive research. Non-traditional sources of income have also been generated. Some significantly relate to students in the form of fees: full-fee payers from overseas, plus professional post-graduate course-work students. Combined, it now has a substantial operating budget exceeding some \$535 million.

Table 8 shows the changing composition of the ANU revenue budget from 2000 to 2003. Growth has been primarily from research grants and full-fee paying (graduate and international) students. Consultancy, contract research, and private revenue were also important, contributing 8.4% of income in 2003.

**Table 8 ANU Revenue Base – recent years (% of total)**

<b>Year ended 31 December</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Operating grant (including HECS & PELS)	56.8	51.7	54.3	41.3
Research funding	9.5	10.0	*14.0	**22.7
Full fee-paying student income	4.2	4.8	6.0	6.8
State grants	0.2	0.2	0.6	0.3
Consultancy, contract research and private grants	6.9	7.1	8.3	8.4
Investment Income	12.4	10.3	5.4	7.4
Other fees and charges	9.7	9.2	10.8	13.2
Other revenue	0.3	6.8	0.6	0.1

\* The first entry of 25% of the IAS staff into ARC and NH&MRC: \*\* the second cohort.

### **Constraints on ANU revenue growth**

Australian universities are earning an increasing share of their operating budgets. ANU's reliance upon base operating grants provided by the Australian Government (including the block grant for the IAS and grants for teaching-related purposes) declined from 65% of total revenue in 1994 to 36% in 2003 [see Table 10]. This compares with a fall from 57% to 25% in that source of funding for other Group of 8 research-intensive universities over the same period [see Table 11]. Contestable funding through the Australian Government rose as a share of revenue from 4% to 20% for other Go8 universities. The IAS only began obtaining competitive grant funding from 2002.

The main sources of revenue growth for all Go8 universities have been income from fees and charges, investments, and consultancies, and from other sources such as bequests, and proceeds from sales and business activities. ANU, as a relatively small and new university, does not benefit as much as the larger and older established universities from donations and bequests. Being located in a small local government jurisdiction, albeit

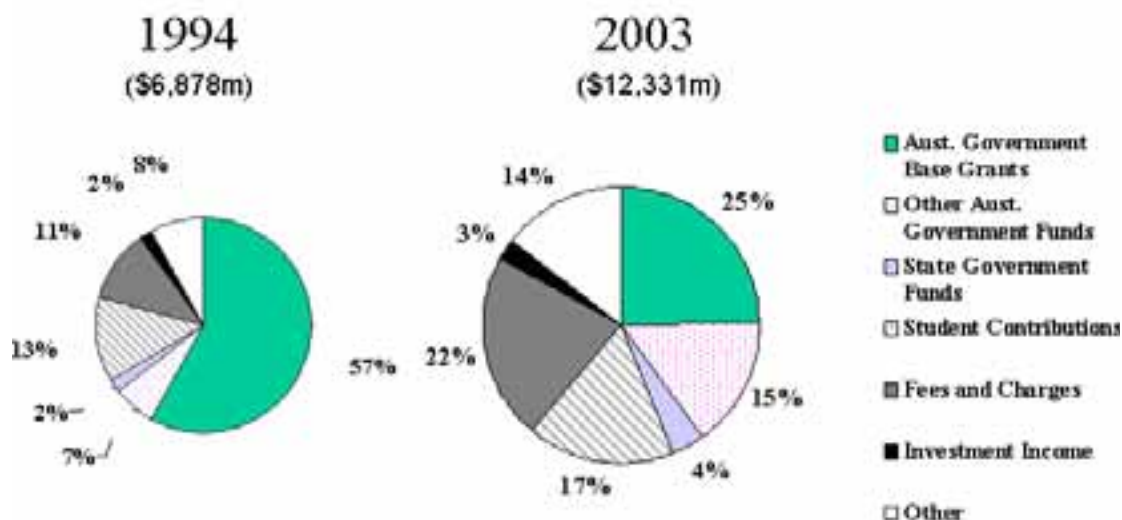
the national capital, ANU lacks the support that universities in State capitals can potentially obtain from State governments. Moreover, universities in capital cities have the advantage of proximity to larger enterprises that invest in R&D and purchase consultancy and training services. In relative terms, the block grant from the Australian Government for the IAS is becoming a more critical component of ANU's sustainability.

**Table 9. Composition of Higher Education Revenues, Australia (\$m)**

	<i>1994</i>	<i>%</i>	<i>2003</i>	<i>%</i>	<i>1994-2003</i>
<b>Australian Government Base Grants</b>	3,989.2	58	3,056.9	24.8	-932.3
<b>Other Australian Government Funds</b>	452.4	6.6	1,862.6	15.1	1,410.2
<b>State Government Funds</b>	133.7	1.9	506	4.1	372.3
<b>Student Contributions</b>	877.7	12.8	2,094.9	16.9	1,216.3
<b>Fees and Charges</b>	741.9	10.8	2,720.7	22.1	1,978.8
<b>Investment Income</b>	129.6	1.9	318.7	2.6	189.1
<b>Other</b>	553.7	8.1	1772	14.4	1,218.8
<b>Total</b>	<b>6,878.2</b>	<b>100</b>	<b>12,331.8</b>	<b>100</b>	<b>5,452.8</b>

**Table 10:**

**Composition of Higher Education Revenues, Australia (\$m)**

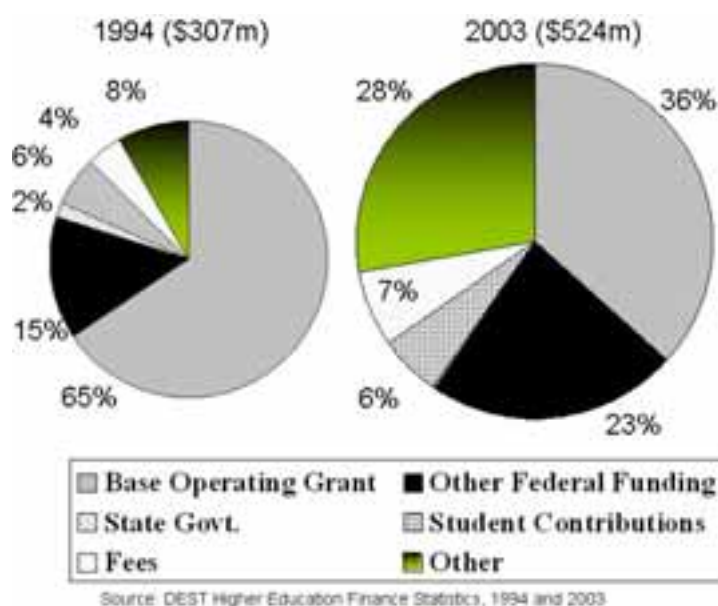


Source: DEST Higher Education Finance Statistics 1994 and 2003

The Institute has been allowed a phased access to the competitive schemes of the Australian Research Council and the National Health and Medical Research Council since 2000. However, the ANU surrendered some 10% of the Institute block fund to 'buy in',

with a further 10% made contestable through Government 'performance-linked' formulae. While ANU's 'winnings' exceed its investment by a reasonable margin they are directed increasingly to short-term research, in contrast to the long-term research enabled by the flexibility of the block fund.

**Table 11: The Composition of ANU Revenue**



### The importance of maintaining adequate block funding for research

Notwithstanding the gains that the University can make through initiatives of the type discussed above, its ability to continue functioning at the highest standards of international research excellence depends on adequate maintenance of the research block grant from the Australian Government.

As we have noted several times, it is the block grant that sustains the long-term and large-scale research that underpins the ANU achievement. The vigour of the Institute of Advanced Studies in fundamental and strategic research, interacts with the high standards of work being done in the Faculties and University Centres, and enables multiple perspectives to be given to complex problems, to the benefit of research and student learning.

Given the major risks to Australia's long term economic foundations posed by the tendency towards increasingly short-term research orientations, through competitive schemes and contracting, the capacity of ANU to conduct longer-term research becomes ever more important to the nation and its international research credibility. Indeed, a strongly performing ANU surely benefits the whole Australian higher education community –through its international reputation, its linkages to international centres of research and scholarship, and its networks of alumni and research collaborators. It is

our strong view that the block grant for the IAS should be sustained and progressively increased over the next five years.

Developments over recent decades, and particularly since the mid 1990s, have resulted in several Australian universities achieving resources for research that were previously available only to ANU. For instance:

- the IAS block grant has barely kept pace with inflation – the grant of \$152 million in 2004 compares with \$21million in 1973 or \$143 million in 2004 prices adjusted by CPI, despite more than a doubling of research staff over the period
- The IAS block grant per researcher has fallen by 60% from \$247,700 in 1973 to \$101,346, in 2004 prices
- The IAS block grant as a proportion of the research income of the other Go8 universities has fallen from 70% in 1973, to 45% in 1992 and to 20% in 2002

Of major concern is the continuing erosion of the block grant for the Institute of Advanced Studies. It has not been increased since the 1995 Review. While it was subject to the 6% cut to operating grants over the four years from 1996, it has been curiously excluded from the 2.5% per annum supplementation over the three years from 2005 that flows to universities, including ANU, meeting governance and workplace reform conditions.

Even though, since the mid 1990s, ANU has continued to improve its performance relative to other Australian universities on a range of measures, particularly on measures of research productivity and impact, the trend improvement in the capacity and performance of several other universities in State capitals suggests that aspects of the distinctiveness that ANU has enjoyed within Australia could gradually diminish as competition intensifies. In these circumstances, that result in part from ANU's contribution to the overall strengthening of Australia's knowledge capability, the opportunity arises for ANU to take the next step in the transformation of Australian higher education by forging stronger international linkages and playing even more strategically on the world stage. We discuss these prospects later in this report.

While the block grant for ANU research affords the University a capacity and flexibility in research orientations that is not so explicitly available to other Australian universities, ANU itself lacks access to sources of income growth that other research-intensive universities can obtain. This disparity results in part from the nature of the Australian Federation and the locational advantages of capital-city State universities in that Federation. State Governments provide their universities with blocks of funding for large research projects, and typically focus intensely on state-based advantage for projects undertaken by institutions within their State. Growing consumption taxation (GST) revenue for the States will exacerbate the ANU's relative disadvantage if the Australian Government's investment in its own national University is not adequately sustained.

Over the last decade, State government funding for research in the university sector has more than doubled. Research income from industry sources has trebled, and research income from donations, bequests and foundations has quadrupled. With a population of

merely one quarter of a million, Canberra and the ACT equate to a small local government area within the broader national setting. Hence, as Table 12 shows, the ANU gains only 2% of the research income from State governments provided to Go8 universities and only 7% of the research income from industry. As a relatively new university, ANU also lacks the endowment flows available to the older, State capital universities – ANU revenues from donations, bequests, etc. represent less than 2% of Go8 revenues from such sources.

**Table 12. Sources of income for research-related activities of Go8 Universities, (excluding competitive grants for research)<sup>27</sup> 2003 (\$m)**

	ANU	Sydney	Melbourne	Qld	UNSW	Monash	UWA	Adelaide	Go8
Australian Government Base Grants	192.6	161.9	143.2	148.8	122.8	203.6	61.3	67.6	1101.8
Other Australian Government Funds	118.6	213.2	238.9	135.8	202.9	56.1	77.3	119.3	1043.5
State Government Funds	1.5	2.8	32.1	20.1	7.8	13.8	28.3	15.3	121.7
Student Contributions	29.6	120.3	99.6	108.5	95.1	117	47.7	49.6	667.4
Fees and Charges	35.4	167.1	249.3	111.3	209.5	194.8	49.4	38.9	1055.7
Investment Income	38.6	53.2	52.5	8.3	19.7	11.9	38.1	8.3	230.6
Other	107.3	156.3	107	199.5	81.5	174.7	118.8	64.4	1009.5
<b>Total</b>	<b>523.6</b>	<b>874.8</b>	<b>922.6</b>	<b>732.3</b>	<b>739.3</b>	<b>771.9</b>	<b>420.9</b>	<b>363.4</b>	<b>5230</b>

Source: DEST (2004) *Higher Education Finance 2003*

The Review Panel has come to some considered views about the operating budget:

- The Block Grant remains absolutely critical in supporting the ANU vision of engaging in strategic and long-term fundamental research.
- The scale of funding involved is modest compared with the resources invested in major universities of international standing in America, Europe and Asia. In the US alone, it is broadly accepted that the entry point for being considered a comprehensive research-intensive university is about \$1.5 billion, some 3 times the ANU operating budget.
- ANU needs to grow its total budget further, and to do so in ways which are consistent with its mission and values. There would be a loss to the Australian research output if the University was too heavily committed to projects which involved substantial gearing, in matched funding, and which run across the capacity to do the kind of fundamental research no longer possible at many other Australian institutions.

<sup>27</sup> Comparable data are not available for this year in respect of competitive research schemes

Aligning income and strategy is a critical dimension of good university management. Performance against agreed targets creates a dynamic budget environment. And having sufficient uncommitted funding resources to support new initiatives is essential to drive change.

This report indicates (below) the core areas where the future ANU should invest to drive forward its pursuit of excellence in those areas of research, research training, knowledge dissemination and service outreach in which ANU can fulfil its 21<sup>st</sup> Century mandate.

### **Opportunities for revenue diversification**

In key areas of its educational expansion, the University has the potential to build its resource base – not least through continuing development of its professional post-graduate programs, and in public policy research areas where the University has an unrivalled national position in Canberra alongside the Federal Government. There is also a major opportunity to increase the post-graduate research load – notably of the IAS – by building on ANU's excellent name in Asia through strategies involving scholarships from overseas governments. Given the relatively small domestic undergraduate load of ANU, drawn mainly from a region of declining youth demographics, there are only limited opportunities for expanding income from that source.

In certain key areas of research and development in which ANU has innovation potential, it will be important to develop a sustained outreach program. These linkages can most fruitfully be established and exploited by a much-expanded system of School, Faculty and Centre advisory boards. These are potentially the major 'diplomats' for ANU into the business community beyond Canberra, and beyond Australia.

There is also much scope for ANU to increase its connectivity with its alumni. There are many reasons for doing so, including the extension of Australia's networks of influence as well as the potential for fund raising.

### **The ANU's management and development of intellectual property**

The ANU has taken some steps towards a culture of innovation among its researchers and students, and actively protects and manages the intellectual property gained through its research. The University has recently developed a number of policies to define ownership and provide procedures for the management of intellectual property.

ANU Innovation is responsible for identifying and recording new intellectual property developed by the ANU academic community. This process is facilitated by Technology Managers outposted to Research Schools, Centres and Faculties. This process produces between 10 and 30 new disclosures being registered per year.

The ANU Patent portfolio is managed by ANU Innovation. It comprises 100 patent families (totalling 419 patents), 45 of which have industry partners. The costs of patent prosecution and renewal (where there is no commercial partner) total some \$400,000 in

2004. ANU Innovation has negotiated approximately 50 licences for access to patented IP (about 10 new licences per year on average), yielding roughly \$500,000 per year.

Past attempts of the University to raise revenue through ANU Innovation have focused on a broad range of activities, including international development assistance consultancies. In 2004, ANU Innovation has re-focused its activities on providing value to the University through collaborative projects with university staff, partnerships with a range of external organisations, and improving its technology transfer processes.

The Review Committee endorses this shift of emphasis. There is a need to balance the pursuit of commercial objectives with the mission and values of the University. And expectations need to be realistic. Income from research commercialisation activities, at the most entrepreneurial of the world's universities, accounts at best for only about 3%-10% of the operating budget – and that is in countries where, unlike Australia, there are substantively high levels of private R&D investment.

But there is also an imperative to maximise the opportunities for the University in its engagement with Innovation. ANU is at the beginning of that development in terms of the scale of global potential in translating major science into innovative enterprises – to the benefit of its research staff and students.

There is a special need to address three key areas of developmental importance where the block grant and Federal allocations are likely to fall short of ANU aspirations. In each case, the University will have to cross-subsidise their development, or generate external income from entrepreneurial activities to take the research and training dimensions of the mission forward. The three areas are:

- The provision of post-graduate research scholarships to award the brightest and best from Australia: but also, more explicitly, from the exceptional cohort of overseas candidates who apply to ANU;
- Investment in undergraduate education to facilitate the substantial expansion of the current elite PhB program and develop similar initiatives for establishing a distinctive research-informed and curiosity-driven learning experience;
- The creation of additional post-doctoral positions to accelerate research performance and enhance focus across the key areas of university excellence.

The Committee is of the strong view that new initiatives of this kind will be critical to strengthening and advancing the fundamental work of the University in an environment of local and regional engagement. As the former Princeton President put it so vigorously only a few years ago:

*"Universities not only need a constantly refreshed vision of their role that reflects the emerging reality of their times, but the intellectual energy to enable society to envision them as important component of society's own vitality"*<sup>28</sup>

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<sup>28</sup> Harold Shapiro, "Professional education and the Soul of the American Research University", September 2001

## ***Creating the future***

A Chinese proverb says that *"when the winds of change are blowing, some people build windbreaks, while others erect windmills"*.

One can accept the challenge and try to get energy out of change or one can hope not to be blown away.<sup>29</sup>

It has become a truism that the great universities of the world retain their pre-eminence because of their capacity to "re-invent" themselves to meet changes in knowledge and society itself. ANU is a great Australian achievement which faces the fundamental challenges experienced by every major research-led institution globally. Key knowledge discoveries have a life of less than a decade in the natural sciences, while the expectations of university stakeholders grow exponentially with the unfolding of the new knowledge economy. Universities cannot live outside these forces of transformation.

Indeed, before any university can aspire to be a contributor to the "creation of the future" – as Professor Frank Rhodes has defined the mission of higher education in the 21<sup>st</sup> century – it must create its own future.

The policy and social environments of the modern university are highly contested and fluid. But that is all the more reason to establish the strategic options for the future. Not to do so is to sail in choppy seas without a considered chart of direction.

The Review considers ANU to have a first-rate performance base on which to build a future of growth and innovation within its overall mission. Indeed, the Committee has identified six areas, from within many options, where the University has great opportunities to build on its strengths and powerfully shape its own future. We here rehearse these options briefly and commend them to the Executive and Council for further detailed work of planning and implementation.

### **Maximising the potential for internal collaborations**

It was several times remarked to us that ANU is an unusually complex organisation, with the implication that such organisational complexity holds back its academic potential.

In fact, all research-intensive universities tend to be marked by complexity – which reflects both the diverse ways in which knowledge itself has evolved within an institution, and also the role played by highly creative research leaders who are more concerned with outcomes and standing than with symmetry and neatness.

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<sup>29</sup> Esben Munk Sorensen (1999) "Vision for Universities – a 5-10 year perspective". Aalborg University, Denmark.

But the Review Committee did observe that there was untapped potential for significant collaboration across disciplines within ANU. The grand challenges to modern research in both of Snow's "two cultures" exist at the intersections of the traditional disciplines. And big questions can be tackled effectively only by bringing a cross-disciplinary approach to inform the analysis.

Alongside the opportunities for the University in making major external collaborative partnerships with key professional stakeholders and government, there is the challenge of developing further its intra-institutional units. The Committee was particularly impressed with the increasing interactions of Institute and Faculties; and equally of the concept of the National Institutes, as a way of drawing together expertise across the University and around a particular intellectual focus.

The Committee was told that many ANU scholars were inclined to press for the development of a "centre" devoted to a particular theme, as this was believed to be the only way to bring together expertise across the campus. This approach is, however, a potentially problematic way of advancing key areas of research. A plethora of small and specialised 'centres' at ANU reflects both a laudable creative urge but also a fragmentation of capacity.

Not all centres are fenced areas of specialisation. Some do indeed foster cross-disciplinary expeditions. The Humanities Research Centre stands pre-eminent in this regard, as it works more like a 'school' of broad studies. But that also suggests to the Committee the importance of not overly prescribing terms of reference in the creation of such research clusters. ANU has an enormous breadth of academic talent, based in a great swathe of disciplines. Its approach to knowledge and research should, in the view of the Committee, be equally broad, bold and big in its configurations. Where other Australian universities are constrained by programs of student study and credentialing imperatives, the ANU can largely paint its own canvas in how it tackles the great research issues, and how it also integrates research and professional studies.

The Committee is particularly supportive of initiatives already evident in the University towards closer integration of the institution, beyond its administrative and structural unity. Establishing key areas of global excellence and allowing these to drive the shape of the University will be critical to its success. This will involve the kind of complexities which are eminently acceptable: cross-disciplinary appointments, collaborative research groupings, shared facilities, experimental seed funding of new areas and innovation in educational programs.

The Committee believes that great research universities shape themselves from within, based on their intellectual capital and research leadership. But it is pleased to reinforce those significant initiatives being taken by the University: the formation of 'the Commonwealth of Asia' to link all Asia-related activities of the University; the integration of the Research School of Information Sciences and Engineering with the Faculty of Engineering and Information Technology, along the lines of the highly successful Mathematical Sciences Institute. These are indicative of the strategic opportunity for ANU to redefine its conception and functioning of the Institute of Advanced Studies as a porous entity comprising a set number of full-time equivalent research positions to

which academic staff from various parts of the University may be appointed at different times and for different periods.

This more fluid and integrating notion of the Institute will be beneficial to both staff and students: it will give all younger staff the opportunity for gaining teaching experience and assist them in their careers; it will give older research staff the opportunity to be refreshed through engagement with the challenges that young minds present; and it will give students more frequent and direct exposure to some of the world's leading researchers whose knowledge is ahead of anything they could read or hear from others. Above all, the inter-twining of the Institute within the fabric of one University is an essential ingredient of productivity improvement, not least through the greater opportunity for staff of the Faculties to concentrate on their research.

Again, our thinking about this matter is not original. The 1978 Review of the research School of Social Sciences recognised the productivity benefits that could flow from greater flexibility in the forms of academic appointment to the Institute:

*"very few scholars have the ability to perform high quality research and nothing else year in and year out over a whole career...Indeed in order to enhance research productivity it may be necessary to devise alternative functions or activities for most people to provide relief from the continuous demands of highly productive research activity...We think that many people permanently engaged in research benefit rather than suffer from regular contact with students."<sup>30</sup>*

And it also marks out for closer consideration areas of key developmental opportunity in areas such as biological sciences, chemistry, environmental studies, humanities and philosophy.

The greatest value-adding in the research outcomes of the University probably lies in the creation of a matrix of cross-linked connections, collaborations and constructs which release the creative capacity of ANU without binding it in structure and red tape.

### **Developing distinctive undergraduate education**

It is important to recognise that a university is more than a collection of research projects, degrees, students, teachers, and researchers. Taking a holistic view of the ANU as a community – its role within the national capital and the nation, its campus, its traditions – education at the ANU could be reinvented to provide something unlike anything else available in Australia.

ANU could aspire to become a small, elite, residentially-based university that would attract the best students from across the entire country, and the Pacific and Asian rim. Pursuing the highest-quality fundamental and professional education, taught in small classes by researchers and graduate students from the IAS and Faculties, students would be educated to be the leaders for the next century.

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<sup>30</sup> Report of the Committee of review of the Research School of Social Sciences, 1978, chaired by Professor Clark Kerr, Berkeley.

In such a vision, ANU would strive for the day on which every undergraduate had an intensive research experience, as well as an intensive experience through an in-service course or internship. To realise such a model, ANU would need to address issues above and beyond internal structure and program offerings. Marketing, accommodation, and the relative size of the undergraduate and postgraduate student bodies would need to be addressed in an effort to shift the entire university culture. We believe such a shift is both possible and desirable, and that in so doing ANU would aspire to more resemble a university like Princeton in the USA than any other.

### **Graduate education and professional training**

We remarked in earlier, that a major face of the ANU of the future will be turned towards graduate research training. Here we comment on the specific need to grow the professional studies dimension of the educational program.

We are aware that some members of leading research-intensive universities feel an antipathy towards the whole notion of professional studies as a major dimension of focus and operations. Some would even go so far as to say "here begins the slippery slope" which endangers the autonomy of the university; and, worse, which creates a fundamental distraction from following its academic mission of knowledge generation.

We do not share that view. Professional studies are increasingly important in the civic responsibility of all higher education institutions. And we would argue that it is pre-eminently the research-led university which is best placed to advance the professions, by engaging in forms of high quality training in which new, critically-tested knowledge is embedded in the utilitarian skilling. Research training is only one half of the role of the research-led university. The other half concerns the making of professionals who will lead and shape the knowledge society itself.

Looking globally and to the long term, major economies and developing societies are committing growing resources to enhance the human capital in the professions. In this regard, higher educational training becomes one of the key growth forces in private and public sectors alike. There is great responsibility and opportunity for the leading universities of the world to engage with this new era of globalisation. Governments are committed to deep investment in professional training, as is the World Bank, major corporations and regional organisations. How the universities will respond will be a critical issue, with economic and social consequences of great significance.

ANU is one of those leading institutions which can respond creatively; and with high quality programs to engage in this professional "knowledge revolution". Because of its history, because of its resources, and because of its reputation, it can make a major contribution in the region: serving Australian national needs and reaching out to a wider constituency in the Asia-Pacific region. Unlike the limitations to an expanding undergraduate market, there is an almost unlimited demand for high quality post-graduate and professional education. As a quality institution, ANU can select quality candidates for its programs.

Examples of areas where ANU can make a contribution include: actuarial studies, professional development of accountants, legal practitioners, engineers, health professionals and para-professionals, foresters, middle managers in computer-aided manufacturing, and cultural heritage conservationists. Application areas of likely interest to developing economies and multilateral development assistance agencies include water conservation, alternative energy generation and distribution, urban planning and management, HIV/AIDS treatment, sustainable forest management, counter-terrorism, including bio-terrorism, financial and regulatory reform.

The educational and professional benefits to that wider region could be a central part of Australia's evolving engagement with the Asia-Pacific. Professional studies within ANU offer considerable growth potential for the University's diversified funding base.

### **Contributing to public policy through excellence in research and scholarship**

Along with professional studies, the University has a major opportunity to develop further its already distinguished programs concerned with public policy. Topics of likely relevance include: inter-generational implications and options arising from population ageing; incentives for promoting productivity improvements; development of indigenous communities; care of the frail aged; incentives for promoting active ageing and reducing health costs; housing affordability; incentives for conserving water; mental health care options; population settlement, urban and regional development and environmental management; incentives for usage of renewable energy; social inclusion of marginally attached people; Australian culture and heritage protection; and public accountability reporting.

Being the seat of the Federal Government, the ACT Government and a great range of NGOs plus industry groups, Canberra breathes the air of public policy. ANU is centrally situated in that environment. Here its "national" role finds a natural focus in national policy as this affects all dimensions of government and governance.

This is not the place to argue the case that much of the future of complex modern societies will be shaped by efficacious public policy. But it can easily be asserted that nations which have poor public policy will be doomed to a poor future. Economic and human wellbeing have a symbiotic relationship with both the professional education and policy frameworks which nurture growth, opportunity and equity for modern society and proud nations.

However, developing good public policy is a far from simple undertaking. It is not enough to work from the manuals of yesterday. Complex and changing societies require increasingly innovative and nuanced public policy which takes account of the new imperatives of local and global forces. Australia does not have the plethora of independent institutes, or "think tanks", which contribute to a rich public policy environment in say the United States or the European Union. It is vitally important therefore that those institutions which have the capacity to contribute to government and public administration do so in significant ways and at a level of international excellence.

There has recently been created a national 'school' of public administration to which ANU is a major contributor. But there remains a major role for ANU itself. The University has the opportunity to exploit its national capital environment, its links with government and its academic range of disciplines which can feed into public policy analysis and projection.

In practical terms there is, indeed, a special opportunity to conduct collaborative research with the agencies of government, as well as to engage in "action research" which draws from the practice of public administration and policy development in government.

### **Building a culture of inclusive external partnerships**

A critical feature of the modern university is the reshaped relationship between the institution and society. This has been as important in transforming the campus and the academy as have been key advances in forms of knowledge production and fundamental research cultures.<sup>31</sup>

And, as we move increasingly to live in the reality, and not merely the rhetoric, of knowledge nations, those forms of relationship become powerful determinants of the idea of the university. The relationship itself is now a subject of scholarly study in works such as *The Idea of Engagement: universities in society*, published by the Association of Commonwealth Universities in 2003, which surveys the range and power of this fundamental shift in the operation of higher education institutions. Gone is the notion of a select and chosen set of links from Ivory Tower to the world beyond the campus. As Patrick Coldstream argued when introducing *The Idea of Engagement*, the modern relationship goes well beyond "links" to an "altogether bigger and riskier matter – a matter of the inter-penetration of universities and the wider society" as it encompasses "the whole orientation of the university's policy and practice".

The future of ANU will enmesh with this transformative revolution; and the question at issue is how the University wishes to structure and develop that inter-dependent organic relationship with society.

The Committee works from the presumption that the University is already outward-looking in its research activities, in the scholarly networks of which its researchers are part, and in membership of a global academy of world class standards of excellence. Where it believes the University could carry this forward is in other areas of its activities.

- Building further strategic alliances with not only research projects but through inter-institutional partnerships, within Australia and beyond.
- Increasing the informal networks of contacts in business and commerce which can lead on to research support and collaborations.
- Developing purposeful construction of alliances with public and private agencies to enhance professional studies.

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<sup>31</sup> Gibbons, M. et al (1994), *The new production of knowledge: the dynamics of science and research in contemporary societies*. Sage Publications. Newbury Park.

- Ensuring that all faculties, schools and centres enjoy the wisdom of external advisory groups or boards, with special knowledge of their particular areas of expertise.
- Deliberately moving outside Canberra and the ACT to create associations which advance the mission of the University, and increase awareness of its role and achievements.
- Making a major commitment to systematic development and fund raising based in the long-term commitment of "friend raising": ensuring that students as alumni remain associated with their university, finding benefactors who share the ANU vision, and harnessing the whole institution (starting with the Council) in building the endowment.

Such as list could be easily extended and readily detailed. The Committee wishes to canvas the exceptional opportunities which lie within engagement of the university with the wider society. Engagement can be seen as a threat to institutional autonomy. Or it can be taken to be a new empowering of the role of the university in the knowledge society of the future.

By way of illustration, discussions underway between ANU and CSIRO regarding the development of a network in Integration and Implementation Sciences could give a boost to 'mode 2' knowledge development in addressing complex problems in a holistic way. The relevant disciplinary contributions of ANU and CSIRO researchers can be thereby harnessed in an interdisciplinary problem-focused context, within Australia and internationally. The Australian Government's response to the 2004 report of the *Review of Closer Collaboration Between Universities and Major Publicly Funded Research Agencies* sets out a framework allowing ANU to engage with others more comprehensively.

### **Leading in Asia, and connecting with Europe and the Americas**

The establishment of the ANU in 1946, in the shadow of the second world-wide war, reflected the perceived need for Australia to support nation-building through the development of its own capacities for research and scholarship, and to understand better the peoples of its neighbouring countries. Approaching the 60<sup>th</sup> anniversary of the ANU's formation, we believe this foundation vision for ANU remains valid in its general aspiration. Naturally, however, it now needs to be interpreted in ways not then envisaged.

First, Australia has moved since World War II from being merely a receiver in the world of knowledge to a producer as well. Australia's higher education system now includes several research-intensive universities, resulting from past periods of responsible and far-sighted public investment in research. ANU has contributed to the transformation of state universities in no small way – by attracting back Australians who had moved to study overseas, and by setting new standards and expectations for staff to do research. ANU continues to add value to the Australian higher education system through the access it offers academics of other Australian universities to its concentration of capabilities, and the opportunities for collaboration in research and scholarship.

ANU is no longer the sole force in Australian university research, but it continues, on the whole, and in several specific fields of research, to be Australia's most internationally distinguished research university. Arguably, the reputation of ANU is higher within the international academic community than with Australia. In continuing to fulfil its special charter of serving the national interest, ANU should not be duplicating what other Australian universities can do well. As the Committee reviewing the Research School of Social Sciences in 1988 pointedly remarked:

*"A 'commitment to change' must mean exploring new opportunities for partnerships as well as leadership. Mental images require reconstruction to accord with the reality of parity rather than paramountcy."<sup>32</sup>*

The 1988 Committee suggested that ANU should increase the proportion of academic visitors from other Australian universities in order to help build up "networks for collaboration with State universities." However, the formulae now used by government for allocating resources for research create disincentives to such movement of staff. In our view, it would be a retrograde step for ANU to reduce the intensity of its international collaborative activities, including its programs for visiting international academics.

Rather, ANU must operate on the world stage, looking intelligently at Australia and Australia's place in the world, and forge strong ties with influential networks in the Asia-Pacific region, North America and Europe. The University can more purposefully broaden its sphere of operation, raise research from the level of 'projects' and 'individuals' to larger-scale, multi-national cooperative research undertakings. The involvement of ANU, together with the University of Sydney as the only Australian institutions, in the Asia-Pacific Rim Universities consortium, and the cooperative agreements it is forging with national universities of other countries, such as Singapore, represents an important strategic connection.

Second, the world is now more linked through rapid communications and transport, enabling richer patterns of trade and investment together with flows of people and ideas. Knowledge is ever more critical to the economic development of nations. Regrettably, these faster technological capacities also allow the more rapid spread of activities that can threaten stability and security around the world. Consequently, nations need timely and reliable understandings of the complex social interactions and the underlying drivers of change and causes of instability. ANU is better placed than most to contribute to understanding the dynamics of the Asia-Pacific, including its varying economic and environmental circumstances, the diversity of religious custom and belief across countries and generations, the implications of modernisation for different community groups and economic sectors, and the associated geo-political consequences.

Growth in Asia will command great attention in the decades ahead, offering immense opportunities and involving many challenges. Australia's own future growth depends in many ways on how well it manages its relations in the region. Australia also has

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<sup>32</sup> Report of the Committee of Review of the Research School of Social Sciences, 1988, chaired by Professor Donald Stokes. Princeton.

considerable capacity to help build regional capacities through skills formation and technology transfer, thereby playing a key role as an agent of positive development.

Australia's experience of colonisation and European heritage as a developed, English-speaking nation, and its location in the Asia-Pacific region, puts it in a unique and important 'bridging' position in world economic, political and cultural relations. Australia has many means, including those facilitated through migration and trade – including trade in education services and research collaboration – for continuing to develop its relations with the Americas, Europe, the Middle East and Africa.

Because of where it is, combined with what it is, ANU has a natural role as an institutional leader in the Asia-Pacific and as a gateway between Asia, the Americas and Europe.

Such international links could include the development of bilateral relationships between ANU and a select number of the world's leading universities and research institutes, in fields of mutual interest where there are reinforcing strengths, including through joint use of campus facilities, across an agreed range of activities. Such activities could include:

- the interchange of students;
- joint degree programs at undergraduate and graduate levels;
- staff exchanges and sabbaticals;
- research collaboration;
- research commercialisation; and
- comparative public policy development.

Fields of possible interest include:

- biosciences;
- physical sciences, astronomy and mathematics;
- Asia-Pacific studies;
- defence and strategic security;
- studies of religion;
- regulatory policies and incentives; and
- quantitative method and training for social sciences;

This role is multi-faceted but it has a core of generic activities:

- Within areas of fundamental research ANU is a lead institution for fostering collaborative enquiry in the natural and health sciences (theoretical as well as experimental).
- To professional studies ANU brings special resources in law, economics, language study, historical enquiry and anthropology, as well as in the broad fields of political and strategic studies: all these are vital in Asia-Pacific regions.

- For the social sciences and humanities, "Asia" is the main domain of ANU's educational and research priorities; and this is on the basis of reciprocity with the societies of the Region.
- ANU also has longstanding connections and depth of scholarship in relation to the cultural heritage of Europe, and contemporary European social and economic developments.

Within the logic of this long-term perspective, ANU has the singular capacity of becoming a pre-eminent "Asia University" – through its student and staff interactions, its research projects and its service to the Region.

Leading "Asia Universities" will catalyse research, generate professional leaders, and open a window into Asia for the rest of the scholarly world. An active agenda of such Regional goals would include:

- strategic alliances with the Region's finest universities, an research institutes and academies;
- effective fellowship schemes to draw in the most talented research and post-doctoral candidates;
- long-term co-operative and multilingual research and educational activities
- an ongoing dialogue of close association between researchers in the Region with ANU as the conference hub of new knowledge exposition; and
- a partnership with government and NGO strategies in Asia as a key component of the national outreach - as Australia comes to occupy its special role in the Region, as its own neighbourhood of interests and identity.

Through government-to-government agreements between Australia and other countries, especially but not exclusively in Asia, graduate students supported by their governments will be able to study and do research at the ANU, enhancing the interaction between Australia and the rest of the region and world, and placing a cohort of leaders in other countries who know, like, and are sympathetic to greater cooperation between their nation and Australia.

ANU has a great future ahead of it. But it will also have to play a dynamic role in shaping its own future.

## **Appendix A. Terms of Reference**

### **For a quality review of the Australian National University**

The Council of the Australian National University, in accordance with its overall responsibilities for the performance of the University, has initiated an independent, external Review of the quality of its performance. The Review will comprehend research and scholarship, research training, undergraduate teaching and learning, postgraduate teaching and learning, national and regional community service, and internationalisation.

The Review is intended to inform the University and the Australian public about the standing of the ANU in the international academic community and about the best ways of developing the potential of the ANU for Australia's longer term national interest. The Review will focus on the quality of the results achieved by the ANU through its various outputs.

The *ANU Quality Review Committee* will finalise a report to the ANU Council before November 2004 on the following matters:

1. the quality of ANU research;
2. the quality of ANU research training;
3. the quality of ANU undergraduate and postgraduate education;
4. the impact of the ANU's regional and national service; and
5. the strength of the ANU's international engagement.

The Council will publish the final report of the *ANU Quality Review Committee* and will also make public its response to the findings and recommendations of the *Committee*.

#### 1. the quality of ANU research

- 1.1 The Review will report on the quality of research activities, with reference to international and national benchmarks of research excellence. The review will encompass all the research activities of the university and will assess the quality of the research performed in the distinctive academic clusters of the ANU - the Institute of Advanced Studies, University Centres and The Faculties, separately and collectively. While acknowledging the separate structural components, the Committee will comment on the overall research strength of the ANU and the synergistic relationships that are developed or could be developed.
- 1.2 The *ANU Quality Review Committee* will employ peer review methods and have regard to bibliometric and other data, and the outcomes of competitive processes, for assessing the quality of research activities. In particular, the *Committee* will pilot the use of a research outcomes assessment exercise in the Australian context and report on its possible wider application. The views of business and public users of research in Australia will also be taken into account.

- 1.3 The *ANU Quality Review Committee* will report on:

- 1.3.1 the excellence of ANU research;
- 1.3.2 the international reputation of ANU research;
- 1.3.3 the national significance of ANU research;
- 1.3.4 the ANU's management and development of intellectual property;
- 1.3.5 the quality of the ANU research environment;
- 1.3.6 the development of research careers of staff;
- 1.3.7 the strength of the ANU's networks for research collaboration;  
and
- 1.3.8 emerging fields and inter-disciplinary areas of research of  
importance to the ANU.

## 2. the quality of research training

### 2.1 The Review will report on:

- 2.1.1 the quality of the ANU research training environment;
- 2.1.2 the quality of the research student experience; and
- 2.1.3 the capabilities of research graduates.

2.2 The *ANU Quality Review Committee* will make use of the results of surveys and other measures of the capabilities and satisfaction levels of graduates and their employment destinations.

## 3. the quality of ANU undergraduate and postgraduate education

### 3.1 The Review will report on:

- 3.1.1 the quality of ANU education at the undergraduate and graduate levels;
- 3.1.2 the special character of ANU education in a research-intensive environment;
- 3.1.3 innovative features of course design and delivery; and
- 3.1.4 the attributes of ANU graduates.

3.2 The *ANU Quality Review Committee* will make use of comparative indicators student satisfaction, and surveys of graduate satisfaction and employment destinations. The *Committee* will also have regard to curriculum materials, and documentation of teaching and learning practices and associated evaluations.

## 4. the quality of ANU service to national and regional communities

### 4.1 The Review will report on:

- 4.1.1 the performance of the ANU as Australia's national university;
- 4.1.2 the contribution of the ANU to public debate, scientific advancement and cultural development; and
- 4.1.3 the regional community benefits of the ANU.

4.2 The *ANU Quality Review Committee* will make use of available statistics and reports on staff participation in public discussions and advising. The *Committee*

will also take account of the views of national and regional users of ANU services.

## 5. the quality of the ANU's international engagement

### 5.1 The Review will report on:

- 5.1.2 the quality of the international student experience;
- 5.1.3 the capabilities of ANU graduates for international employment;
- 5.1.4 the extent and quality of ANU research collaboration internationally; and
- 5.1.5 the quality of service to the international community.

5.2 The *ANU Quality Review Committee* will assess the ANU's policy documentation, including international agreements and memoranda of understanding, and have regard to the findings of surveys and focus groups of students and staff, and the satisfaction levels of graduates.

## Other Matters

A. In reviewing the performance of the Institute of Advanced Studies, the *ANU Quality Review Committee* will report specifically on:

- i. the capacity of the Institute to sustain excellent long-term, basic research; and
- ii. the appropriate future level of block funding for the Institute.

B. In evaluating the overall quality of ANU outcomes, the *Committee* will comment on general policy principles, organisational arrangements and administrative procedures for providing robust support to the ANU's relentless pursuit of excellence.

## **Appendix B: Membership of the Review Committee**

### **Chair:**

**Professor Deryck Schreuder**, Visiting Fellow, University of Sydney. Vice-Chancellor and Principal, The University of Western Australia (1998-2004);

### **Members:**

**Dr Tom Everhart**, President, California Institute of Technology (1987-1997)

**Professor Deborah Freund**, Vice-Chancellor and Provost, Syracuse University, NY.

**Professor Franz Kuna**, Pro Vice-Chancellor (Teaching and Research), Klagenfurt University, Austria (until 2003)

**Professor Sir Colin Lucas**, Vice-Chancellor, University of Oxford (1997-2004)

**Ms Heather Ridout**, Chief Executive, Australian Industry Group.

**Professor Frank Shu**, President, National Tsing Hua University, Taiwan.

**Professor Wim Stokhof**, Director, International Institute of Asian Studies, Leiden, The Netherlands.

**Dr Jan Veldhuis**, President, Utrecht University, The Netherlands (1985-2004)

**Professor Sir David Williams QC**, Vice-Chancellor, University of Cambridge (1989-1996)

### **External Members:**

**Professor Jeremy Knowles**, Dean, Faculty of Arts and Sciences, Harvard University (1991-2002)

**Dr Rita Colwell**, Director, National Science Foundation. (1998-2003)

## **Appendix C:            Abbreviations**

ABS	Australian Bureau of Statistics
AIMS	Australian Institute of Marine Science
ANSTO	Australian Nuclear Science and Technology Organisation
ANU	The Australian National University
ARC	Australian Research Council
AVCC	Australian Vice-Chancellors' Committee
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEST	Department of Education, Science and Training
DSTO	Defence Science and Technology Organisation
GDLN	Global Development Learning Network
Go8	Group of Eight Research-Intensive Australian universities
IAS	Institute of Advanced Studies
NGO	Non-Government Organisation
NHMRC	National Health and Medical Research Council
NICTA	National Information and Communications Technology Australia