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# Melbourne Institute Index of the International Standing of Australian Universities 2005

Ross Williams and Nina Van Dyke

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Ross Williams  
Nina Van Dyke  
*Melbourne Institute*  
*University of Melbourne*

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## 1. Introduction

University ratings are undertaken and used for a range of purposes. In the USA and Canada, the emphasis is on the rank order of institutions within the country. By contrast, in continental Europe and Asia the emphasis is more on bench marking across countries and ascertaining the attributes of a world class university. European interest in ratings is being driven by the 1999 Bologna Declaration to move to an integrated system of higher education throughout Europe by 2010. In China, the ranking of world universities by the Institute of Higher Education at Shanghai Jiao Tong University (SJTU) was undertaken in order to see how Chinese universities compared internationally and what needed to be done to raise their comparative performance.

Methodological interest in rating the world's universities has spread from measuring just research performance, with a heavy emphasis on research in the sciences, to the inclusion of a range of other attributes such as research performance in the humanities, teaching quality in all fields, and management practices.

Widening the range of variables included in ranking exercises is more easily done at the national level than at the international level, at least in the first instance. We undertook such a project for Australia in 2004 and constructed The Melbourne Institute Index of the International Standing of Australian Universities. We included data not only on research performance but also on other attributes, such as the quality of undergraduate and graduate programs, that define a world class university. The methodology and results were published as report number 4 in the Melbourne Institute Report Series (available at [www.melbourneinstitute.com/publications/reports](http://www.melbourneinstitute.com/publications/reports)) and in *Higher Education* (forthcoming).

Our use of the criterion, “international standing”, narrows the choice of variables to be included. The quantitative variables used are chosen because (i) they are important for international standing, (ii) they conceptually have their counterparts in most university systems, which facilitates international comparisons, and (iii) they are publicly available. In the 2005 Index, all the quantitative data have been updated and some improvements made in the data (see Section 3 for details).

In the 2004 Index the quantitative variables were complemented by qualitative data obtained from surveys of presidents and vice-chancellors of the world's leading universities and deans of Australian universities. The survey data have been carried over into the 2005 Index and are thus unchanged. In the surveys, all respondents were asked to rate each Australian university on a five-point scale. Australian deans and New Zealand vice-chancellors were also asked to provide a ranking of the top ten Australian universities using as the criterion, 'international standing'. The presidents, vice-chancellors and deans were, in addition, asked to place weights on the various broad attributes that determine international academic standing. We used these weights to construct our measures of international standing in 2004 and we use the same weights in the 2005 update.

## **2 . Determinants of International Standing**

A feature of our Index is that we take account not only of research performance but also of performance in areas such as research training and teaching. The broad determinants of international standing that we use, with weights obtained from the surveys, are given below. Details of the variables included under each category are given in the Appendix.

- quality/international standing of academic staff as measured by criteria such as number and quality of publications, competitive grants obtained, and honours achieved (40%)
- quality of graduate programs (16%)
- quality of undergraduate intake (11%)
- quality of undergraduate programs (14%)
- resource levels (11%)
- opinions gained from surveys of university CEOs and deans (8%)

A distinguishing feature of our approach is that wherever possible we calculate two sets of measures: one for the laboratory sciences and one for all other disciplines. We do this because of differences between the two groups of disciplines in matters such as the conduct and dissemination of research, teaching modes and funding. Unless some allowance is made for these differences, rankings can be unduly affected by the discipline composition of a university.

We believe that international standing is determined by gross measures of performance. We do not attempt to measure value added, which considers the impact of a university on performance above and beyond input measures such as student characteristics. Value added measures are of course important for other purposes, such as equity funding.

### 3. Data Changes from 2004

The most important change in the data is the use of a much more robust figure for the quality of the undergraduate intake. In 2004 the measure was based on the distribution of the Tertiary Entrance Scores (TES) across courses at a given percentile. We chose the median TES for the 50<sup>th</sup> percentile ('the median median'). We replace this measure with the average TES for all undergraduates enrolled in an institution in 2004. This measure implicitly averages intake quality over several years.

The only other conceptual change is in the publications and citation data contained in Essential Sciences Indicators (ESI), a data bank which forms part of the Thomson organisation's International Science Indicators (ISI). In 2004, publications and citations were included in the data base for each of the various disciplines only if a threshold level was reached in that discipline group. The threshold was: top 1 per cent of institutions in the world in a discipline group based on citations over the past decade. In 2005 the data includes all publications by an institution provided it reached a threshold in at least one discipline. It still holds, however, that if a university did not reach the threshold level in any discipline then a zero entry is recorded. The time period for the ESI data has been moved forward one year and covers the period January 1995 to April 2005.

The use of a ten-year time span might be expected to disadvantage the newer universities compared with including only more recent years. If the newer universities were performing relatively better in more recent years this improvement should show up through a reduction over time in the dispersion across universities in the number of publications. We test this hypothesis by comparing ESI publications over the decade 1994-2003 with the number of publications in all journals in the ISI data bank for the five year period 1999-2003. Somewhat surprisingly, there is little evidence of a reduction in dispersion of publications across Australian universities: the coefficient of variation is only marginally lower for the shorter period: 1.28 for the shorter-period versus 1.31 for ESI.

The time period for all the quantitative data has been moved forward one year from that used in 2004. We have continued to modify data used in calculating staff-student ratios to ensure consistent coverage in staff and student data, e.g. when contract staff are not included in the official statistics we adjust the official student numbers to exclude the students taught under these arrangements. Data for resources have been corrected to exclude revenue from TAFE courses.<sup>1</sup> Full details of the data used are given in the Appendix.

The conceptual changes in the definitions of some variables mean that in general it is not possible to ascribe changes in rankings between 2004 and 2005 as due to changes in performance. We will do so only in areas where the data definitions are unchanged.

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<sup>1</sup> The corrected data are contained in the article forthcoming in *Higher Education*. The effect on the overall ranking is quite small, in part because TAFE data were originally included in only one of the two years over which we averaged.

What can be said is that the 2005 rankings are a better measure of international standing in 2005 than were the 2004 rankings a measure of international standing in 2004.

#### **4. Results for 2005**

We include in our ranking all those universities which are members of the Australian Vice-Chancellors Committee (with the exception of Bond University, where not all the data series are available) plus the University of Notre Dame, Australia. Each table of results is now discussed in turn.

##### *Table 1: International Impact of Academic Staff*

We use the term international *impact* of staff to describe measures of total output. We assert that there is a positive relationship between the volume of output (appropriately measured) from an institution and awareness of the institution. Our survey of CEOs of foreign universities tended to support this view. Measures of total output favour large diverse institutions.

Three universities stand out as having the greatest international impact. In rank order they are the University of Melbourne, the University of Sydney and the Australian National University (ANU).

##### *Table 2: Quality of Academic Staff*

In Table 2 we adjust the results obtained in Table 1 by dividing total output by the number of academic staff that produced that output. We use the expression ‘quality of academic staff’ to describe output per person. The three universities that dominate the total impact measure are now joined by the University of Western Australia (UWA). The ranking, from first to fourth on this measure, is ANU, UWA, Melbourne and Sydney.

##### *Table 3: Measures of overall standing for each attribute.*

In Table 3 we present results for all six attributes of international standing listed in section 2. The universities are listed in order of the ranking arrived at using the total output measure. We emphasise as we did in 2004 that the rankings reflect only one way (international standing) of looking at performance.

The first two columns of data reproduce the overall results for international standing of academic staff, in levels and performance per head. The third data column contains rankings for quality of graduate programs, in which Melbourne and Queensland perform best.

In looking at teaching programs we use attributes that are typically associated with world class universities. The dispersion in the ratings is much less for the quality of undergraduate intake and undergraduate programs than it is for research performance.

The fourth data column is based on the new measure of quality of undergraduate intake. UWA ranks highest followed by the University of Melbourne. In the ranking of undergraduate programs, ANU has risen several places from 2004 to head the list from UWA.

The federal government intends to encourage good teaching through a Learning and Teaching Performance Fund (LTPF). In order to allocate these funds the Department of Education, Science and Training (DEST) has compiled two sets of data on teaching quality. One data set uses gross or unadjusted data; the other set uses measures adjusted for the characteristics of students. These data can be combined into two separate rankings of teaching performance. It is of interest to compare the implied DEST rankings with our measure of the quality of undergraduate programs, although it is crucial to note that our emphasis is on international standing rather than teaching excellence per se. There is a moderate relationship between the rankings: the correlation coefficient between our ranking of undergraduate programs and the ranking implicit in the LTPF data is 0.636 for the DEST gross measures and 0.557 for the adjusted measures. We use gross measures in the Melbourne Institute Index, so as expected the correlation is higher with the DEST gross measure than with the adjusted measure.

The fifth column measures ranking by resources, where ANU dominates. In column six we reproduce the 2004 qualitative results which showed that vice-chancellors and presidents of top overseas universities and deans of Australian universities rated the University of Melbourne first, followed by ANU and then Sydney.

*Table 4: Overall Results*

In Table 4 we present the overall rankings of international standing in three ways, which differ in the treatment of institutional size. The first panel presents results in which research is measured essentially by total output (total impact); in the second panel we use research performance per head, which is an average measure of staff performance; in the third panel we combine the two measures into a single index as we did in 2004.

In all three panels we find, as in 2004, that the rankings generally follow the groupings of universities: the Go8 institutions fill the first eight places on each of the three aggregate measures, followed by the International Research Universities Australia (IRUA), members of the Australian Technological Network (ATN) and the New Generation Universities (NGU)

Research performance tends to dominate the overall ratings for two reasons: the relatively large weight of 40 per cent given to research performance and the wide dispersion in this measure across universities.

If no adjustment is made for size, the top three universities are Melbourne, ANU and Sydney. ANU is a clear first once adjustment is made for size of institution, followed by Melbourne and Western Australia.

Panel three contains the Melbourne Institute Index of International Standing of Australian Universities. The Index is obtained by combining the indexes in the first and second panels in Table 4. The data in the two panels are measuring different concepts: total impact and average performance. How should the two measures be combined to form a single index? In constructing the 2004 Index we matched the subjective rankings obtained from surveys with the quantitative data of performance. Correlation analysis gave weights of 0.84 for the total output measure (first panel) and 0.16 for the measures derived by adjusting research output by size of university (second panel). We used these weights to combine the total output measure and the measure adjusted for university size.

The results obtained in 2004 clearly suggest that the total output measure matters most, but given that we did not resurvey in 2005 and also changed some definitions of the quantitative variables, to use the 2004 weights would give a false impression of precision.

In 2005 we alter the weights slightly to 0.75 for the rankings in levels and 0.25 for the per capita estimates. Because a number of attributes are common to both measures, these new weights imply that research performance per staff member has a weight in the Index of 0.10 ( $0.25 \times 0.40$ ), the same weight as in the Shanghai Jiao Tong University (SJTU) ranking of the world's top 500 universities.<sup>2</sup> (see <http://ed.sjtu.edu.cn/en/index.htm>)

The Melbourne Institute Index of the International Standing of Australian Universities for 2005 is given in the last panel of Table 4. In 2005, ANU and Melbourne tie for the top ranking, followed by Sydney at number three, Queensland, and then New South Wales. Our top 15 institutions are the same 14 Australian universities ranked in the top 500 in the world by SJTU, plus Wollongong. The ordering of these top universities is also very similar to that of SJTU. Details are given in Table 5.

## 5. Concluding Remarks

Our 2004 survey of CEOs of the top foreign universities showed that the SJTU work provides a very good indication of the world rankings of Australian universities: two in the range 50 to 100 and 14 in the top 500. It is neither feasible nor appropriate for every Australian university to have a mission statement which proclaims that it aims to be in the top x per cent in the world using as the criterion international academic standing. A nation needs a range of tertiary institutions to meet the diverse needs of its students.

One may argue, however, that ranking by institution masks variations in performance by department. In particular, universities which rank lower in overall performance may contain some departments that rank very highly internationally. In order to pick up these pockets of excellence we need to accompany the rankings of institutions with evaluations of the international standing of disciplines within universities.

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<sup>2</sup> An alternative approach, which we tried, is to conduct sensitivity analysis over a range of weights and to group universities whose ranges overlap. It is a feature of this method that many more universities are grouped as being equal. In practice the weakness of the method is that the gap between the bottom university in a group and the top university in the next group is given exaggerated importance.

**Table 1: International Impact of Academic Staff**

University	DEST	ESI	ESI	ESI	ESI	Highly Cited	Academy Membership	National	Other	Standardised Total
	Publications	Publications (Lab)	Publicatons (NonLab)	Citations (Lab)	Citations (NonLab)			Competitive Grants	Research Income	
	(0.10)	(0.10)	(0.05)	(0.17)	(0.08)	(0.05)	(0.20)	(0.15)	0.10	
University of Melbourne	100.0	88.5	84.2	96.4	72.5	39.1	71.6	100.0	100.0	100.0
University of Sydney	93.2	100.0	67.6	100.0	83.5	26.1	55.3	84.5	84.4	92.3
Australian National University	77.1	69.1	100.0	88.4	100.0	100.0	100.0	53.0	39.0	91.9
University of Queensland	92.2	85.2	62.6	81.1	51.7	4.3	34.0	69.0	91.9	75.5
University of New South Wales	82.7	71.4	80.9	66.7	89.6	21.7	29.1	64.2	64.7	70.5
Monash University	86.6	65.4	38.4	63.8	36.0	4.3	28.7	50.7	64.5	58.8
University of Western Australia	51.2	57.3	25.3	51.9	26.4	30.4	28.4	55.5	37.8	48.9
University of Adelaide	46.9	48.1	22.4	44.3	20.3	8.7	13.5	55.0	39.0	40.5
La Trobe University	28.3	20.7	33.6	18.5	32.0	4.3	27.0	11.7	13.7	24.3
University of Newcastle	28.7	26.5	28.2	22.1	29.6	13.0	7.8	17.9	16.7	22.7
University of Tasmania	23.5	21.9	16.0	18.1	10.5	4.3	6.4	19.6	17.0	17.8
Flinders University of South Australia	23.1	17.7	23.1	17.3	19.7	4.3	9.9	12.2	15.3	17.7
Macquarie University	27.4	19.0	18.9	18.0	17.3	13.0	9.9	10.7	9.0	17.5
Griffith University	32.3	14.7	29.3	9.4	16.9	0.0	7.1	11.3	20.7	16.5
Queensland University of Technology	34.3	15.4	25.0	9.1	22.0	0.0	1.4	8.2	15.3	14.5
University of Wollongong	26.8	17.9	11.4	11.4	8.7	0.0	2.8	12.2	11.1	12.9
Curtin University of Technology	23.1	12.5	22.1	7.2	19.3	0.0	1.4	6.7	23.7	12.8
Deakin University	28.3	10.9	22.7	6.6	22.0	0.0	2.1	7.7	12.8	12.5
Murdoch University	16.9	11.9	12.2	7.6	10.1	8.7	4.3	11.4	18.2	12.0
James Cook University	14.8	15.8	8.7	12.9	8.4	0.0	2.8	7.2	10.9	10.5
University of New England	13.0	10.3	17.4	7.4	13.4	0.0	7.8	8.7	6.6	10.5
University of Technology, Sydney	23.4	9.4	12.0	5.1	11.6	4.3	5.7	7.6	8.1	10.4
University of South Australia	26.9	8.9	11.3	5.2	8.3	0.0	2.8	6.0	17.0	10.2
University of Western Sydney	25.3	5.4	12.9	2.8	14.3	4.3	5.0	5.4	6.5	9.3
RMIT University	29.0	5.5	0.0	4.3	0.0	0.0	2.1	4.9	18.9	8.4
Edith Cowan University	18.9	3.0	12.5	1.6	11.8	0.0	0.7	1.9	4.0	5.6
Charles Sturt University	13.7	3.8	10.6	1.9	9.7	0.0	0.7	4.3	2.2	5.1
Victoria University	17.4	3.9	0.0	2.3	0.0	0.0	1.4	2.8	4.4	4.2
Swinburne University of Technology	13.3	0.0	0.0	0.0	0.0	0.0	4.3	4.1	6.1	3.9
University of Canberra	8.0	0.0	0.0	0.0	0.0	0.0	2.1	1.4	7.1	2.5
Southern Cross University	6.3	0.0	0.0	0.0	0.0	8.7	0.7	1.9	4.4	2.2
Central Queensland University	9.1	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.3	1.7
Australian Catholic University	7.4	0.0	0.0	0.0	0.0	0.0	2.1	0.8	1.8	1.7
University of Southern Queensland	5.7	0.0	0.0	0.0	0.0	0.0	0.0	1.7	4.2	1.5
Charles Darwin University*	3.5	0.0	0.0	0.0	0.0	0.0	0.7	1.9	3.0	1.2
University of Ballarat	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.0	1.1
University of the Sunshine Coast	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4
University of Notre Dame Australia	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2	0.3

\* In all Tables, the ESI data do not include the Menzies School of Health Research

**Table 2: Quality of Academic Staff (Performance Adjusted for Staff Numbers)**

University	DEST Publications (0.10)	ESI Publications (0.15)	ESI Citations (Lab) (0.17)	ESI Citations (NonLab) (0.08)	Highly Cited (0.05)	Academy Membership (0.20)	National Competitive Grants (0.15)	Other Research Income (0.10)	Standardised Total
Australian National University	100.0	86.7	100.0	81.0	100.0	100.0	63.6	55.0	100.0
University of Western Australia	99.9	100.0	70.8	84.5	45.7	42.6	100.0	80.0	89.7
University of Melbourne	92.0	75.8	85.1	69.7	27.7	50.8	85.0	100.0	86.6
University of Sydney	88.8	86.8	78.1	100.0	19.1	40.6	74.3	87.4	83.4
University of Adelaide	89.0	81.9	71.9	73.5	12.7	19.7	96.5	80.5	76.7
University of New South Wales	88.5	72.2	73.0	89.8	17.9	24.0	63.5	75.2	71.7
University of Queensland	87.9	74.5	74.4	66.8	3.2	25.0	60.8	95.3	71.4
University of Tasmania	79.5	68.1	64.4	53.1	11.4	16.7	61.4	62.7	61.0
Flinders University of South Australia	79.2	58.0	76.5	68.9	11.5	26.3	38.8	57.0	60.7
Monash University	74.4	50.9	76.2	75.8	2.9	19.0	40.3	60.3	57.9
University of Newcastle	69.6	60.3	65.3	85.2	24.4	14.6	40.0	43.9	56.0
Murdoch University	70.6	46.3	50.4	67.3	27.9	13.7	43.9	82.7	54.2
University of New England	70.3	54.7	56.4	62.6	0.0	32.4	43.4	38.6	54.0
Macquarie University	73.2	47.3	74.0	74.2	26.8	20.4	26.2	26.1	51.9
La Trobe University	56.7	40.5	70.1	77.3	6.7	41.5	21.7	29.8	51.7
James Cook University	63.4	60.8	63.9	78.3	0.0	9.3	28.4	50.8	50.6
University of Wollongong	90.6	55.0	49.8	61.9	0.0	7.4	38.2	40.8	48.6
Deakin University	78.5	30.5	47.1	78.5	0.0	4.5	19.9	38.7	39.8
Griffith University	57.8	26.5	50.1	46.8	0.0	9.8	18.7	40.4	35.6
Curtin University of Technology	48.8	26.1	45.2	70.9	0.0	2.3	13.1	54.4	34.7
Queensland University of Technology	62.8	27.7	46.2	71.3	0.0	2.0	13.8	30.4	34.1
University of South Australia	62.0	19.6	46.0	59.6	0.0	5.0	12.7	42.6	33.4
University of Technology, Sydney	52.9	20.3	41.9	78.4	7.6	9.9	15.8	19.8	32.9
University of Western Sydney	55.4	12.3	40.4	89.8	7.3	8.4	11.0	15.5	30.8
Charles Sturt University	55.9	16.2	40.6	74.8	0.0	2.2	16.2	9.7	28.6
Edith Cowan University	62.6	11.7	41.9	76.4	0.0	1.8	5.8	14.4	27.6
RMIT University	55.3	9.1	60.5	0.0	0.0	3.1	8.7	39.2	26.6
Victoria University	57.9	11.3	45.9	0.0	0.0	3.6	8.7	16.0	21.9
Swinburne University of Technology	65.2	0.0	0.0	0.0	0.0	16.1	18.5	32.4	18.2
Charles Darwin University	50.0	0.0	0.0	0.0	0.0	7.8	24.8	46.3	17.2
University of Canberra	54.6	0.0	0.0	0.0	0.0	11.2	8.9	52.6	16.5
Southern Cross University	45.0	0.0	0.0	0.0	47.5	3.9	12.4	33.8	14.9
University of Ballarat	60.3	0.0	0.0	0.0	0.0	0.0	8.9	36.1	12.7
Central Queensland University	46.2	0.0	0.0	0.0	0.0	0.0	7.1	18.5	8.7
University of Notre Dame Australia	23.4	0.0	0.0	0.0	0.0	19.3	0.0	8.4	8.1
University of the Sunshine Coast	50.7	0.0	0.0	0.0	0.0	0.0	5.8	9.7	8.0
Australian Catholic University	36.8	0.0	0.0	0.0	0.0	8.2	3.7	9.8	7.9
University of Southern Queensland	26.1	0.0	0.0	0.0	0.0	0.0	7.3	21.0	6.7

**Table 3: Measures of International Standing for each Attribute**

Group	University	International	Research	Graduate	Undergrad	Undergrad	Resources	Views of	Overall Ranking	Overall Ranking
		Impact of Staff*	performance per head*	Programs	Intake	Programs		CEOs and Deans	(total research)	(research per head)
		(0.40)	(0.40)	(0.16)	(0.11)	(0.14)	(0.11)	(0.08)		
Go8	University of Melbourne	100.0	86.6	100.0	98.6	95.2	65.8	100.0	100.0	92.2
Go8	Australian National University	91.9	100.0	81.5	92.9	100.0	100.0	95.7	97.1	100.0
Go8	University of Sydney	92.3	83.4	95.0	95.5	89.6	60.1	84.0	92.7	87.2
Go8	University of Queensland	75.5	71.4	99.5	96.7	96.5	62.4	69.1	86.7	83.0
Go8	University of New South Wales	70.5	71.7	87.7	97.3	98.2	58.3	68.0	82.3	81.6
Go8	Monash University	58.8	57.9	89.7	92.9	90.7	50.2	56.1	74.2	71.7
Go8	University of Western Australia	48.9	89.7	76.1	100.0	98.8	68.6	47.5	71.2	89.5
Go8	University of Adelaide	40.5	76.7	78.2	90.3	88.7	60.1	43.5	64.1	80.4
IRUA	La Trobe University	24.3	51.7	74.0	81.2	80.2	43.6	19.9	50.4	62.5
IRUA	Macquarie University	17.5	51.9	71.2	92.8	89.0	47.9	21.1	50.3	65.6
IRUA	Flinders University of South Australia	17.7	60.7	76.3	84.6	84.3	45.8	19.0	49.2	68.6
IRUA	University of Newcastle	22.7	56.0	68.6	88.5	77.1	42.5	16.1	48.8	63.4
	University of Tasmania	17.8	61.0	71.5	82.5	79.2	48.8	20.0	47.9	68.3
	University of Wollongong	12.9	48.6	68.6	89.9	91.0	47.7	15.5	47.4	64.5
IRUA	Murdoch University	12.0	54.2	68.7	92.3	92.2	46.8	12.9	47.2	67.4
IRUA	Griffith University	16.5	35.6	69.5	91.0	80.4	41.5	18.0	47.2	55.3
ATN	Curtin University of Technology	12.8	34.7	73.8	93.3	77.2	49.9	16.2	46.9	56.7
ATN	Queensland University of Technology	14.5	34.1	72.4	92.3	71.8	41.0	19.2	45.7	53.9
	Deakin University	12.5	39.8	69.8	84.1	75.1	52.6	15.9	45.1	57.6
	University of New England	10.5	54.0	66.2	72.4	88.2	49.3	15.6	43.8	65.4
ATN	University of Technology, Sydney	10.4	32.9	69.3	90.0	76.3	41.5	16.2	43.7	53.3
	James Cook University	10.5	50.6	65.2	87.1	71.2	51.0	14.3	42.9	61.5
ATN	University of South Australia	10.2	33.4	67.2	80.9	74.4	46.1	13.6	42.3	52.4
NGU	University of Canberra	2.5	16.5	66.0	88.2	85.6	44.5	14.3	41.2	47.6
ATN	RMIT University	8.4	26.6	60.5	82.0	73.6	47.0	16.6	40.7	48.8
	Swinburne University of Technology	3.9	18.2	60.8	79.6	80.9	44.0	6.7	38.5	45.7
NGU	Southern Cross University	2.2	14.9	76.3	73.6	75.7	39.5	5.4	38.3	47.6
NGU	Victoria University	4.2	21.9	65.3	72.3	80.7	37.9	9.6	38.1	46.0
NGU	Central Queensland University	1.7	8.7	56.8	85.3	73.8	51.5	8.7	37.6	40.6
NGU	University of Western Sydney	9.3	30.8	56.7	78.9	67.5	38.6	7.8	37.5	46.9
NGU	Edith Cowan University	5.6	27.6	61.8	79.8	65.8	39.6	9.0	36.9	46.3
	Charles Darwin University	1.2	17.2	67.9	78.3	62.9	50.7	7.8	36.6	45.3
NGU	University of Southern Queensland	1.5	6.7	64.8	85.2	74.9	30.4	6.3	36.3	38.2
	Charles Sturt University	5.1	28.6	61.6	73.8	69.0	39.0	7.0	36.2	46.3
NGU	Australian Catholic University	1.7	7.9	55.0	83.6	74.0	34.1	6.4	34.9	37.2
NGU	University of Ballarat	1.1	12.7	55.8	74.9	72.6	44.4	5.0	34.7	40.0
NGU	University of the Sunshine Coast	0.4	8.0	25.8	82.9	72.1	42.3	5.2	29.9	33.2
	University of Notre Dame, Australia	0.3	8.1	31.2	72.2	61.3	36.4	4.3	27.2	30.9

\* alternative measures of international standing of staff

**Table 4: Alternative Measures of International Standing of Australian Universities, 2005**

<b>International Standing (total impact)</b>				<b>International Standing (research component adjusted for size of institution)</b>				<b>Melbourne Institute Index of the International Standing of Australian Universities*</b>			
Group	University	Score	Rank	Group	University	Score	Rank	Group	University	Score	Rank
Go8	University of Melbourne	100	1	Go8	Australian National University	100	1	Go8	Australian National University	100	1
Go8	Australian National University	97	2	Go8	University of Melbourne	92	2	Go8	University of Melbourne	100	1
Go8	University of Sydney	93	3	Go8	University of Western Australia	90	3	Go8	University of Sydney	93	3
Go8	University of Queensland	87	4	Go8	University of Sydney	87	4	Go8	University of Queensland	87	4
Go8	University of New South Wales	82	5	Go8	University of Queensland	83	5	Go8	University of New South Wales	84	5
Go8	Monash University	74	6	Go8	University of New South Wales	82	6	Go8	University of Western Australia	77	6
Go8	University of Western Australia	71	7	Go8	University of Adelaide	80	7	Go8	Monash University	75	7
Go8	University of Adelaide	64	8	Go8	Monash University	72	8	Go8	University of Adelaide	70	8
IRUA	La Trobe University	50	9	IRUA	Flinders University of South Australia	69	9	IRUA	Flinders University of South Australia	55	9
IRUA	Macquarie University	50	9		University of Tasmania	68	10	IRUA	La Trobe University	55	9
IRUA	University of Newcastle	49	11	IRUA	Murdoch University	67	11	IRUA	Macquarie University	55	9
IRUA	Flinders University of South Australia	49	11	IRUA	Macquarie University	66	12		University of Tasmania	54	12
	University of Tasmania	48	13		University of New England	65	13	IRUA	Murdoch University	53	13
	University of Wollongong	47	14		University of Wollongong	65	13	IRUA	University of Newcastle	53	13
IRUA	Murdoch University	47	14	IRUA	La Trobe University	63	15		University of Wollongong	53	13
IRUA	Griffith University	47	14	IRUA	University of Newcastle	63	15	ATN	Curtin University of Technology	50	14
ATN	Curtin University of Technology	47	14		James Cook University	62	17	IRUA	Griffith University	50	14
ATN	Queensland University of Technology	46	18		Deakin University	58	18		University of New England	50	14
	Deakin University	45	19	ATN	Curtin University of Technology	57	19		Deakin University	49	19
	University of New England	44	20	IRUA	Griffith University	55	20		James Cook University	49	19
ATN	University of Technology,Sydney	44	20	ATN	Queensland University of Technology	54	21	ATN	Queensland University of Technology	49	19
	James Cook University	43	22	ATN	University of Technology,Sydney	53	22	ATN	University of Technology,Sydney	47	22
ATN	University of South Australia	42	23	ATN	University of South Australia	52	23	ATN	University of South Australia	46	23
ATN	RMIT University	41	24	ATN	RMIT University	49	24	ATN	RMIT University	44	24
NGU	University of Canberra	41	24	NGU	Southern Cross University	48	25	NGU	University of Canberra	44	24
	Swinburne University of Technology	39	26	NGU	University of Canberra	48	25	NGU	Southern Cross University	41	26
NGU	Central Queensland University	38	27	NGU	University of Western Sydney	47	27		Swinburne University of Technology	41	26
NGU	Southern Cross University	38	27		Charles Sturt University	46	28	NGU	University of Western Sydney	41	26
NGU	Victoria University	38	27	NGU	Edith Cowan University	46	28	NGU	Victoria University	41	26
	Charles Darwin University	37	30		Swinburne University of Technology	46	28		Charles Darwin University	40	30
NGU	Edith Cowan University	37	30	NGU	Victoria University	46	28	NGU	Edith Cowan University	40	30
NGU	University of Western Sydney	37	30		Charles Darwin University	45	32	NGU	Central Queensland University	39	32
	Charles Sturt University	36	33	NGU	Central Queensland University	41	33		Charles Sturt University	39	32
NGU	University of Southern Queensland	36	33	NGU	University of Ballarat	40	34	NGU	University of Southern Queensland	38	34
NGU	Australian Catholic University	35	35	NGU	University of Southern Queensland	38	35	NGU	University of Ballarat	37	35
NGU	University of Ballarat	35	35	NGU	Australian Catholic University	37	36	NGU	Australian Catholic University	36	36
NGU	University of the Sunshine Coast	30	37	NGU	University of the Sunshine Coast	33	37	NGU	University of the Sunshine Coast	31	37
	University of Notre Dame, Australia	27	38		University of Notre Dame, Australia	31	38		University of Notre Dame, Australia	29	38

\* Weight of 0.75 on scores on panel 1 and 0.25 on panel 2 corresponding to weight of 0.10 on staff output per head.

**Table 5: 2005 Rankings, Shanghai Jiao Tong University and Melbourne Institute**

Shanghai Jiao Tong University			Melbourne Institute	
Australian Rank	World Rank	University	Australian Rank	University
1	56	Australian Natlional University	1	Australian National University
2	82	University of Melbourne	1	University of Melbourne
3	101-152	University of Queensland	3	University of Sydney
3	101-152	University of Sydney	4	University of Queensland
5	153-202	University of New South Wales	5	University of New South Wales
5	153-202	University of Western Australia	6	University of Western Australia
7	203-300	Monash University	7	Monash University
7	203-300	University of Adelaide	8	University of Adelaide
7	203-300	Macquarie University	9	Flinders University
10	301-400	University of Newcastle	9	La Trobe University
11	401-500	Flinders University	9	Macquarie University
11	401-500	La Trobe University	12	University of Tasmania
11	401-500	Murdoch University	13	Murdoch university
11	401-500	University of Tasmania	13	University of Newcastle
			13	Wollongong University

### ***Appendix: Variables and Weights used in Measuring the International Standing of Australian Universities***

The period of coverage of the ESI data is January 1995 to April 2005. The ISI data for highly cited researchers covers the period 1981-1999.

The shorthand expression *NonLab* is used to refer to performance in the social sciences, business and the humanities; the expression *Lab* refers to performance in science, engineering, medicine and related areas.

The weights for the six broad categories are derived from the responses to our questionnaire by the CEOs of the world's top universities. Within each broad category the subcategory weights are stated (they sum to one). In the empirical work, the results for each subcategory are standardised with the score for the highest performing institution set at 100. The scores for each subcategory are then added using the weights given below and the results rescaled such that the score for the highest performing institution is set at 100. The process is repeated using the scores out of 100 for the six categories to obtain an overall index.

#### *1. Quality and International Standing of Staff (40 per cent)*

##### (a) Measures of total performance

- publications (0.25):
  - Lab ESI articles (0.10)
  - NonLab ESI articles (0.05)
  - Department of Education, Science and Technology (DEST) audited publications, average 2002 and 2003 (0.10)
- citations (0.25):
  - Lab ESI (0.17)
  - NonLab ESI (0.08)
- peer recognition (0.25):
  - Academy membership at June 2005 (0.20)
  - ISI highly cited researchers (0.05)
- research income, average 2002-2003 (0.25):
  - National Competitive Grants (0.15)
  - other research income (0.10)

*Sources:* Thompson data base, Department of Employment, Science and Education (DEST), websites of the four academies: Humanities, Science, Social Sciences, and Technological Sciences and Engineering.

(b) Measures of performance scaled for size

- publications (0.25):
  - DEST scores per academic staff member, including research-only staff (0.10)
  - ESI count per head (0.15)
- citations per article (0.25):
  - Lab ESI (0.17)
  - NonLab ESI (0.08)
- peer recognition (0.25):
  - Academy membership per academic staff member (0.20)
  - highly cited researchers per head (0.05)
- research income (0.25):
  - National Competitive Grants per academic (0.15)
  - other income per academic (0.10)

2. *Quality of Graduate Program (16 per cent)*

- PhD Completions, average 2002-2003 (0.35)
- postgraduate completion rates, 2003 (0.30):
  - domestic students (0.15)
  - international students (0.15)
- student evaluation of their PhD program: mean responses on a five-point scale, averaged over most recent three years, to PREQ survey question “overall I was satisfied with the quality of my higher degree research experience” (0.35)

*Sources:* DEST, Graduate Careers Council of Australia (GCCA)

3. *Quality of Undergraduate Intake (11 per cent)*

- Mean Tertiary Entrance Score for all enrolled undergraduates in 2004.

*Source:* DEST

#### 4. *Quality of Undergraduate Programs (14 per cent)*

Measures use data for students enrolled in 2003

- inverse of attrition rate (0.25):
  - domestic students(0.125)
  - international students (0.125)
- ratio of academic staff to students (0.25):
  - Lab (0.125)
  - NonLab (0.125)
- student evaluation of course measured as mean response on a five-point scale to CEQ question “overall I was satisfied with the quality of this course” (0.25):
  - Lab (0.125)
  - NonLab (0.125)
- percentage of students graduating with a pass or honours bachelors degree who in the next year are enrolled in a higher degree (0.25):
  - masters by coursework (0.10)
  - honours degree, masters by research or PhD (Lab 0.075, NonLab 0.075)

*Sources:* DEST and GCCA

#### 5. *Resource Levels (11 per cent)*

Measures of revenue, average 2002-2003

- revenue per academic member of staff (0.75)
- revenue per student (0.25)

*Source:* DEST

#### 6. *Peer Opinion (8 per cent)*

Survey undertaken in 2004

- ratings by CEOs (presidents) of foreign universities (0.50)
- ratings by Australian deans (0.25)
- rankings by Australian deans and New Zealand vice-chancellors (0.25)