



The use of bibliometrics in research assessment exercises – the policy imperatives that are driving recent developments around the world

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Changes to the way research funds are allocated to Universities

"... the existing distribution of university research block funding is based on inadequate proxy measures of quality, eg numbers of publications, external research income and student completions. Clearly these quantity-based measures do not satisfactorily assess the quality of research undertaken in the university sector."

- October 2004



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The Research Quality Framework

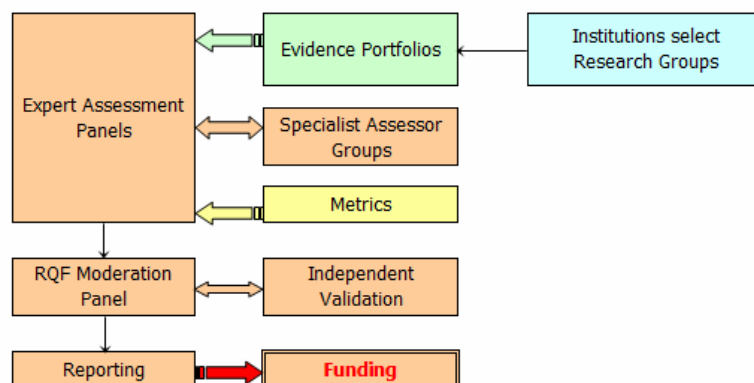
"The RQF must have international credibility in that it provides **benchmarked data** against which the **international standing** of Australian university research can be measured. To achieve this, the RQF must be done rigorously, apply internationally-recognised assessment tools and feature strong international representation on the assessment panels."



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The RQF Process





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RQF definitions of quality and impact

- the **quality** of original research including its intrinsic merit and *academic impact*. Academic impact relates to the recognition of the originality of research by peers and its impact on the development of the same or related discipline areas within the community of peers; and
- the **impact** or *use of original research outside of the peer community* that will typically not be reported in traditional peer review literature, i.e. the extent to which research is successfully applied during the assessment period for the RQF. Broader impact or usefulness relates to the recognition by qualified end-users that quality research has been successfully applied to achieve social, cultural, economic and/or environmental outcomes.



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Evidence for quality assessment

Provided by the Group:

- Four 'best' research outputs for each researcher in the Group
- Full list of research outputs for the Group
- Other evidence of research quality provided as part of a context statement

Supplementary information:

- Metrics



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Metrics: fundamental issues

- Role of the indicators
- Level of aggregation
- Number and range of measures
- Source of data



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Role of indicators

- Replace peer review
- Lighten the load of peer review
- Validate peer review
- Inform decision making

Level of aggregation

- Single publication
- Individual researcher
- **Group output**
- University output aggregate by RFCD codes

- Four 'best' publications
- **Full output**

Number and range of metrics

- One metric
- **A 'basket' of measures**
- **Generic or discipline-specific?**

- Centrally collected and/or extracted
- Each university/group provides their own
- Use existing data sources

- Relevance and validity
- Suitability
- Reliability
- Transparency
- Cost efficiency
- Simplicity
- Positive behavioural impact
- Acceptability

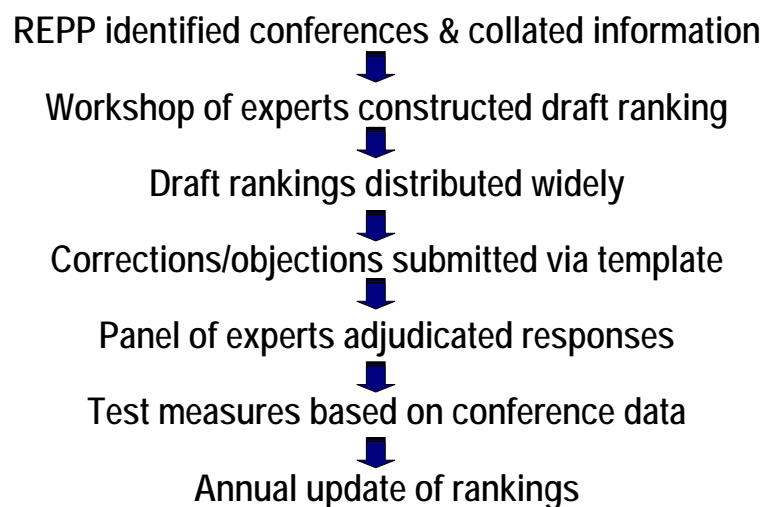


The RQF quality metrics

- **Competitive grant income**
 - Disaggregated by type of grant
 - *for all disciplines*
- **Ranked outputs**
 - Distribution across 4 prestige bands (5 / 15 / 30 / 50)
 - *for all disciplines*
- **Citation data**
 - Citations per publication
 - Distribution across percentiles (top 1%, 10%,)
 - *for disciplines where > 50% in indexed journals + engineering*



Ranking computer science conferences



Descriptors for tiers

Primary determinant: the quality of the papers presented at the conference

Tier 1:

- People from overseas congratulate you for getting in and you “shout” drinks to the research group
- The work presented will shape the field
- Program committee dominated by field leaders
- Value from attending even if don't give a paper



Tier 3:

- Some confidence research is done
- Program committee ... removes anything ridiculous or ignorant of state of the art
- Includes ... where main function is the social cohesion of the community
- High acceptance rates and very few leading researchers from top institutions

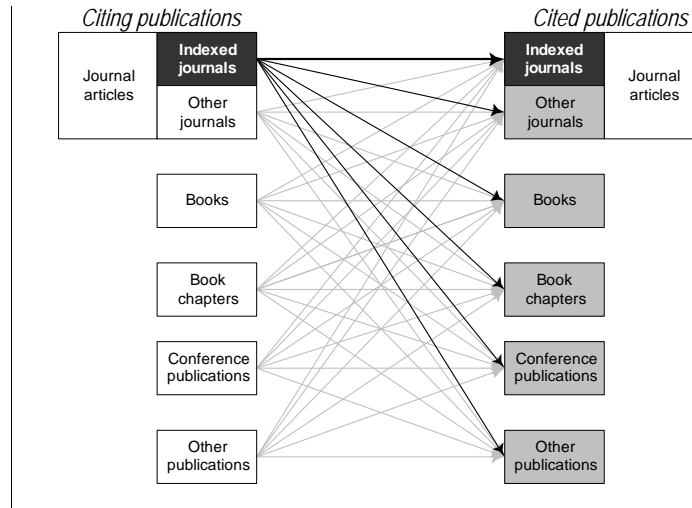
Tier 4:

- The rest

ISI Coverage

Field	DEST Publication Categories				ISI Percentage of:		
	Books	Book Chapters	Journal Articles	Conf. Papers	All Pubs	Journal Articles	
Band 1	Chemical Sciences	0.2	2.1	95.7	1.9	84.6	88.0
	Biological Sciences	0.3	6.3	90.7	2.7	75.6	81.7
	Physical Sciences	0.1	2.6	90.0	7.3	74.3	82.0
	Medical & Health Sci	0.3	6.3	90.5	2.9	69.3	73.7
Band 2	Agriculture	0.4	5.9	79.0	14.7	63.6	78.7
	Earth Sciences	0.9	7.7	82.2	9.2	60.3	72.7
	Mathematical Sciences	0.7	4.3	83.8	11.2	56.8	67.2
	Psychology	1.5	17.4	76.2	4.9	53.6	69.4
Band 3	Engineering	0.4	2.5	52.0	45.1	37.2	71.0
	Philosophy	6.0	23.8	64.8	5.4	28.1	40.3
	Economics	2.9	24.5	64.5	8.0	24.4	37.2
Band 4	Human Society	3.5	27.8	63.0	5.6	18.7	28.3
	Politics and Policy	5.8	37.3	46.1	10.8	16.5	33.6
	Computing	0.4	4.6	32.8	62.3	15.9	47.8
	History	11.6	34.0	50.6	3.8	14.5	27.6
	Management	1.3	11.7	52.9	34.0	12.6	23.2
	Language	6.5	34.0	51.8	7.6	11.4	19.3
	Education	2.5	19.3	54.5	23.6	9.7	17.2
	The Arts	4.4	20.8	54.5	20.3	9.5	16.0
	Architecture	3.0	17.8	35.6	43.6	6.4	17.7
	Law	4.1	22.1	71.9	1.9	5.4	6.6
Journalism, library	3.4	15.2	57.2	24.2	4.4	7.6	

ISI coverage of citations



Study outline

- 'DEST' publications from 2000-2005 provided by 19 unis
- Covered history and political science departments
- Web of Science 'mined' for citations to all publications
- Analysis presented to workshops of experts
- Workshop outcomes provided to DEST
- Methodology and recommendations available at:

www.chass.org.au

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ISI Journal articles, 2000-2005

University	Number of Publications	No of Citations	Citations per Publication	rank
Victoria Univ	1	5	5.00	1
ANU	90	398	4.42	2
Charles Darwin Univ	1	4	4.00	3
Griffith Univ	13	47	3.62	4
Univ of Adelaide	7	23	3.29	5
Flinders Univ	6	17	2.83	6
Univ of QLD	35	95	2.71	7
Univ of WA	9	23	2.56	8
Univ of Melbourne	19	47	2.47	9
La Trobe Univ	8	19	2.38	10
Univ of Sydney	9	18	2.00	11
Macquarie Univ	2	4	2.00	12
Monash Univ	15	26	1.73	13
Univ of Wollongong	2	3	1.50	14
Univ of NSW	8	12	1.50	14
Univ of South Australia				16
James Cook Univ				16
Total	225	741	3.29	

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Total publications, 2000-2005

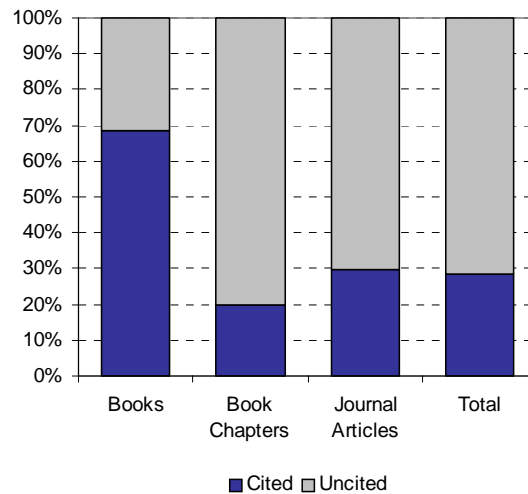
University	Number of Publications	Number of Citations	Citations per Publication	rank
ANU	585	887	1.52	1
La Trobe Univ	102	140	1.37	2
Griffith Univ	170	158	0.93	3
Univ of Adelaide	139	114	0.82	4
Univ of Melbourne	201	164	0.82	5
Univ of QLD	385	271	0.70	6
Monash Univ	276	186	0.67	7
Macquarie Univ	58	32	0.55	8
Flinders Univ	105	57	0.54	9
Univ of WA	118	52	0.44	10
Univ of Sydney	86	36	0.42	11
Univ of NSW	107	41	0.38	12
Univ of South Australia	27	10	0.37	13
Victoria Univ	42	14	0.33	14
Charles Darwin Univ	16	5	0.31	15
Univ of Wollongong	42	13	0.31	16
James Cook Univ	3	0	0.00	17
Total	2462	2180	0.89	



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Citedness: by publication type



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Response to the measures

Combined recommendations:

- Standard citation measures rejected
- 'Enriched' bibliometric measures supported if they are used to inform, not replace, peer review and:
 - Bibliometric experts annotate the data before they are provided to the RQF panels
 - Staff numbers (including no. publishing) provided
 - Citations are measured over a seven year period
-

- **UK Research Assessment Exercise**
 - Peer review to be replaced by metrics
- **Scandinavian Countries**
 - Introducing performance measures for funding
- **Germany**
 - Starting to give preferential funding to a limited number of universities
- **Spain**
 - Further developing quantitative performance measures for researchers

<http://repp.anu.edu.au>