

Global vision ensures healthy competition

The elite institutions have mostly held their places, but below them is a host of challengers from around the world. **John O'Leary** tracks changes in fortunes and refinements in survey methods

This third edition of *The Times Higher* World University Rankings shows most of the leading institutions maintaining their positions, but considerable change further down the main table. Harvard University remains at the top of the tree — albeit with a much-reduced lead at the end of a turbulent year — and Imperial College London is the only newcomer in the top ten.

Cambridge University has moved up to second place and Yale University has entered the top five for the first time, but there is a settled look about the leading group. US universities still dominate the top ten, with the UK well represented, but the top 30 includes institutions from China, Australia, France, Singapore, Japan, Canada and Switzerland.

After only two years, inevitably the rankings are still settling down. The methodology continues to be refined — in this edition, for example, with a shift from measuring ten years of citations to five — and the prevailing views of universities do alter. As a result, there have been some big shifts this year. Tsing Hua University, which regularly tops China's domestic university league tables, is a prime example, climbing from outside the top 50 to 28th place.

There will be further changes of methodology as new sources of comparison become available. But, for the sake of consistency, the basis of the rankings has remained the same in the current edition. More academics from a wider range of countries have taken part in the peer-review exercise conducted by QS Quacquarelli Symonds, and the company's survey of international employers has been greatly expanded, but the same six measures have been used as in 2005.

Consequently, the calculation of citations

per academic and the ratio of students to academic staff remain the other key indicators, while the proportion of international staff and students is included with a lower weighting. A full explanation of this year's methodology follows on pages 6 and 7.

'The decision to opt for a stable system at this stage has not been for want of discussion'

The decision to opt for a stable system at this stage has not been for want of discussion with academics and university administrators in many parts of the globe. Over one weekend in May, the rankings were being discussed in Berlin, Seoul and Tartu, in Estonia. Other meetings have been held in Australia, Japan, Greece and Lithuania, to name but a few. The overriding theme of these debates has been the difficulty of sourcing truly international data and agreeing a framework for comparing the world's great universities.

Ranking universities will remain controversial for the foreseeable future. But there is much less argument than there was two years ago about whether the process should even be attempted.

Universities continue to define themselves internationally, both at subject level and as whole institutions. Different rankings have emerged in the past 12 months, and there is broad acceptance that cross-border comparisons are here to stay in higher education.

David Levin, the president of Yale, gave his account of what makes a global university in the magazine *Newsweek* earlier this year. "In response to the same forces that have propelled the world economy, universities have become more self-consciously global: seeking students from around the world who represent the entire spectrum of cultures and values, sending

their own students abroad to prepare them for global careers, offering courses of study that address the challenges of an interconnected world and collaborative research programmes to advance science for the benefit of all humanity," he wrote.

The World University Rankings will continue to focus on research, teaching and international outlook, attempting to give a picture of current strengths rather than the backward look that is inherent in tallies of Nobel prizes and other accolades from past decades. That requires not only the adoption of proxy measures such as staffing levels, in the absence of international comparisons of teaching standards, but also the sampling of expert opinion. As in previous editions, full-time academics have been asked to identify the leading universities in their own discipline, and their views have been aggregated into a judgment on overall institutions. The results by groups of subjects — the arts and humanities, social sciences, natural sciences, biomedicine and engineering and IT — will appear in *The Times Higher* over the next three weeks.

'There is broad acceptance that cross-border comparisons are now here to stay'

But the aim is to produce the most expert view of academic strengths rather than an impressionistic verdict on whole universities that may be swayed by outside factors.

The main ranking, as in previous years, is more diverse than many experts would have predicted.

Thirty countries have universities in the top 200 in the world, and

more will be represented in the 500 that will be listed in a book based on the rankings to be published in the next few weeks.

There remain issues about the advantages enjoyed by English-language universities and those institutions with a base in science and medicine, but there will be continuing efforts to level the playing field as far as is practicable.

THE WORLD'S TOP 200 UNIVERSITIES

Source: QS

2006 RANK	2005 RANK	NAME	COUNTRY	PEER REVIEW SCORE (40%)	RECRUITER REVIEW (10%)	INT'L FACULTY SCORE (5%)	INT'L STUDENTS SCORE (5%)	FACULTY/STUDENT SCORE (20%)	CITATIONS/FACULTY SCORE (20%)	OVERALL SCORE
1	1	Harvard University	US	93	100	15	25	56	55	100.0
2	3	Cambridge University	UK	100	79	58	43	64	17	96.8
3	4	Oxford University	UK	97	76	54	39	61	15	92.7
4=	2	Massachusetts Institute of Technology	US	81	93	11	39	42	54	89.2
4=	7	Yale University	US	72	81	45	26	93	24	89.2
6	5	Stanford University	US	82	85	9	34	32	55	85.4
7	8	California Institute of Technology	US	53	21	24	40	67	100	83.8
8	6	University of California, Berkeley	US	92	75	6	13	22	39	80.4
9	13	Imperial College London	UK	65	44	55	56	88	12	78.6
10	9	Princeton University	US	68	61	21	29	53	34	74.2
11	17	University of Chicago	US	57	67	19	30	73	17	69.8
12	20	Columbia University	US	57	64	9	32	74	17	69.0
13	11	Duke University	US	39	78	11	21	100	19	68.3
14	15	Beijing University	China	70	55	5	11	69	2	67.9
15	14	Cornell University	US	60	74	10	25	44	26	65.9
16	23	Australian National University	Australia	72	30	48	33	38	13	64.8
17	11	London School of Economics	UK	42	85	89	100	53	1	63.9
18	24	Ecole Normale Supérieure, Paris	France	46	30	22	28	69	37	63.3
19=	22	National University of Singapore	Singapore	70	44	82	47	22	8	63.1
19=	16	Tokyo University	Japan	72	29	8	10	35	27	63.1
21	24	McGill University	Canada	57	61	31	33	52	10	62.3
22	19	Melbourne University	Australia	72	44	51	36	25	7	61.6
23	27	Johns Hopkins University	US	49	37	15	20	65	29	61.3
24	21	ETH Zurich	Switzerland	51	25	84	45	44	23	59.7
25	28	University College London	UK	46	28	39	47	70	12	58.7
26	32	Pennsylvania University	US	45	64	17	26	52	22	57.8
27	29	University of Toronto	Canada	63	51	37	17	15	25	57.7
28	62	Tsing Hua University	China	45	34	22	9	84	1	56.1
29=	31	Kyoto University	Japan	61	20	15	7	44	18	56.0
29=	36	University of Michigan	US	50	61	15	19	46	15	56.0
31	37	University of California, Los Angeles	US	58	42	2	12	34	25	55.9
32	26	University of Texas at Austin	US	44	56	24	14	19	53	55.0
33=	30	Edinburgh University	UK	54	42	28	29	42	11	54.8
33=	41	University of Hong Kong	Hong Kong	48	40	84	27	46	6	54.8
35=	44	Carnegie Mellon University	US	44	64	28	40	48	11	54.6
35=	38	Sydney University	Australia	65	26	56	31	23	8	54.6
37	10	Ecole Polytechnique	France	37	40	18	40	64	17	53.0
38	33	Monash University	Australia	57	40	61	51	21	5	52.6
39	88	Geneva University	Switzerland	26	13	69	58	81	7	49.9
40	35	Manchester University	UK	44	50	42	29	38	6	49.0
41	40	University of New South Wales	Australia	56	36	23	37	20	7	48.2
42	46	Northwestern University	US	32	71	12	20	44	19	47.9
43	56	New York University	US	39	51	8	16	55	6	47.6
44	42	University of California, San Diego	US	46	16	3	9	26	42	47.5
45	47	Queensland University	Australia	52	26	51	31	18	12	47.2
46=	52	Auckland University	New Zealand	51	17	44	21	38	2	46.8
46=	73	King's College London	UK	42	28	42	30	44	7	46.8
48=	73	Rochester University	US	21	26	8	23	91	12	46.7
48=	58	Washington University, St Louis	US	25	32	5	18	73	22	46.7
50=	38	University of British Columbia	Canada	51	38	23	15	19	16	46.4
50=	51	Chinese University of Hong Kong	Hong Kong	39	38	62	24	41	7	46.4
52	69	Sciences Po	France	21	29	22	53	86	-	45.6
53	114	Vanderbilt University	US	22	37	2	14	81	14	45.3
54=	71	Brown University	US	32	32	34	20	50	18	45.0
54=	66	Copenhagen University	Denmark	44	21	12	13	51	5	45.0
56	141	Emory University	US	19	38	1	14	84	15	44.9
57	50	Indian Institutes of Technology	India	45	34	0	1	27	24	44.5
58=	45	Heidelberg University	Germany	43	28	17	28	36	11	44.3
58=	43	Hong Kong University Sci & Technol	Hong Kong	40	41	74	21	17	16	44.3
60	109	Case Western Reserve University	US	19	34	3	24	77	19	44.2
61=	117	Dartmouth College	US	22	56	13	17	59	16	43.7
61=	48	Nanyang Technological University	Singapore	40	37	77	56	21	3	43.7
63	93	Seoul National University	South Korea	43	13	2	7	57	4	43.6
64=	49	Bristol University	UK	36	44	37	26	34	10	43.2
64=	34	Ecole Polytech Fédérale de Lausanne	Switzerland	28	13	70	66	47	11	43.2
66	54	Boston University	US	35	38	9	21	47	10	42.9
67	70	Eindhoven University of Technology	Netherlands	19	18	21	11	92	3	42.1

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68	84	Indian Institutes of Management	India	31	46	0	10	60	2	41.6
69	58	Amsterdam University	Netherlands	42	20	30	10	28	15	41.3
70=	103	School of Oriental and African Studies	UK	23	9	48	74	64	0	40.4
70=	105	Osaka University	Japan	39	0	4	9	45	17	40.4
72	92	Ecole Normale Supérieure, Lyon	France	21	18	15	19	50	34	40.1
73	77	Warwick University	UK	39	40	38	41	22	4	40.0
74	95	National Autonomous Univ of Mexico	Mexico	29	36	3	1	65	0	39.8
75	127	Basel University	Switzerland	21	0	76	28	63	10	39.7
76	88	Catholic University of Louvain (French)	Belgium	37	25	29	25	29	11	39.4
77	58	University of Illinois	US	39	31	10	16	32	9	39.3
78	111	Trinity College Dublin	Ireland	37	34	58	29	17	9	39.1
79=	186	Otago University	New Zealand	26	17	94	20	45	3	38.5
79=	73	University of Wisconsin	US	39	11	0	14	35	16	38.5
81	101	Glasgow University	UK	35	33	17	16	35	9	38.4
82=	67	Macquarie University	Australia	32	40	100	51	10	5	38.3
82=	105	Technical University Munich	Germany	30	26	22	30	42	10	38.3
84	88	Washington University	US	31	23	13	10	38	20	38.2
85	97	Nottingham University	UK	34	37	34	29	28	6	38.1
86	53	Delft University of Technology	Netherlands	34	13	52	18	37	7	38.0
87	65	Vienna University	Austria	43	22	23	26	10	15	37.8
88	193	Pittsburgh University	US	22	19	20	10	62	11	37.6
89	133	Lausanne University	Switzerland	20	21	54	33	53	9	37.3
90=	143	Birmingham University	UK	34	27	34	29	28	9	37.2
90=	138	Leiden University	Netherlands	33	21	33	11	20	26	37.2
92	57	Erasmus University Rotterdam	Netherlands	22	49	24	31	11	38	37.1
93=	79	Lomonosov Moscow State University	Russia	42	28	1	7	30	3	37.0
93=	88	Pierre and Marie Curie University	France	31	0	29	35	49	6	37.0
95	120	Utrecht University	Netherlands	37	12	24	9	25	18	36.7
96	95	Catholic University of Leuven (Flemish)	Belgium	37	35	11	20	18	13	36.6
97	108	Wageningen University	Netherlands	16	9	16	45	61	17	36.5
98	55	Munich University	Germany	35	23	19	21	29	9	36.4
99=	112	Queen Mary, University of London	UK	26	9	44	40	47	4	36.3
99=	64	Pennsylvania State University	US	33	43	7	8	31	6	36.3
101	124	University of Southern California	US	27	28	7	28	45	9	36.2
102=	159	Georgetown University	US	19	65	6	17	41	11	36.1
102=	150	Rice University	US	20	31	12	23	50	15	36.1
102=	143	Sheffield University	UK	31	22	32	28	33	8	36.1
105=	80	University of Adelaide	Australia	38	0	47	44	14	14	35.9
105=	112	Humboldt University Berlin	Germany	32	15	18	18	43	5	35.9
105=	100	Sussex University	UK	27	18	42	27	41	6	35.9
108	114	National Taiwan University	Taiwan	40	0	1	0	43	4	35.8
109=	136	St Andrews University	UK	26	20	40	53	33	9	35.7
109=	85	Zurich University	Switzerland	26	0	69	23	41	11	35.7
111=	133	Maryland University	US	27	33	16	15	35	14	35.6
111=	180	Uppsala University	Sweden	36	0	17	8	41	9	35.6
111=	199	Wake Forest University	US	10	32	2	6	80	10	35.6
111=	80	University of Western Australia	Australia	34	11	61	28	19	13	35.6
115	217	University of Twente	Netherlands	23	15	29	16	59	3	35.5
116=	72	Fudan University	China	39	47	11	8	18	2	35.4
116=	62	Helsinki University	Finland	38	20	7	5	16	20	35.4
118	99	Tokyo Institute of Technology	Japan	29	18	3	14	39	16	35.3
119	77	Hebrew University of Jerusalem	Israel	41	0	14	5	22	16	35.2
120	215	Keio University	Japan	28	25	18	4	48	2	35.1
121	103	Leeds University	UK	32	33	28	25	25	7	35.0
122	180	Lund University	Sweden	35	0	26	9	36	10	34.8
123	143	University of North Carolina	US	23	38	7	8	36	19	34.6
124=	68	University of Massachusetts Amherst	US	32	28	1	10	20	23	34.5
124=	109	York University	UK	28	22	31	30	33	8	34.5
126	138	Aarhus University	Denmark	30	15	38	13	33	9	34.4
127	61	Purdue University	US	32	42	20	15	21	6	34.2
128=	222	Kyushu University	Japan	21	17	8	8	59	7	34.1
128=	129	Nagoya University	Japan	29	11	4	9	41	13	34.1
130=	164	Tufts University	US	17	31	12	17	42	22	33.9
130=	105	Virginia University	US	20	57	6	11	34	14	33.9
132	83	Durham University	UK	25	41	43	25	23	10	33.8
133=	149	University of Alberta	Canada	32	11	40	21	17	18	33.6
133=	259	Brussels Free University (Flemish)	Belgium	16	15	21	17	72	-	33.6

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133=	157	Hokkaido University	Japan	29	0	8	6	52	8	33.6
133=	168	Newcastle upon Tyne University	UK	25	24	33	32	36	7	33.6
137	177	Nijmegen University	Netherlands	21	9	33	10	55	7	33.5
138	86	Vienna Technical University	Austria	29	17	27	34	36	3	33.3
139	119	Liverpool University	UK	26	26	32	21	32	8	33.2
140	234	Cranfield University	UK	14	26	31	62	52	2	33.0
141=	159	University of California, Santa Barbara	US	31	11	7	8	22	24	32.9
141=	228	Cardiff University	UK	29	13	27	23	36	4	32.9
141=	219	Ghent University	Belgium	29	9	20	10	43	4	32.9
141=	206	Southampton University	UK	26	16	38	25	34	7	32.9
145	147	Georgia Institute of Technology	US	30	36	2	27	19	13	32.8
146	82	RMIT University	Australia	34	26	31	65	9	1	32.5
147=	166	Chalmers University of Technology	Sweden	27	9	17	8	46	5	32.4
147=	188	Tel Aviv University	Israel	35	22	0	3	13	21	32.4
148	172	Free University Berlin	Germany	37	0	27	17	25	6	32.3
150=	184	Korea University	South Korea	25	8	5	19	55	1	32.2
150=	125	Texas A&M University	US	30	39	12	13	16	13	32.2
152	179	Notre Dame University	US	19	51	17	14	35	9	32.0
153	130	Bath University	UK	21	36	34	35	32	5	31.8
154	178	City University of Hong Kong	Hong Kong	28	11	75	14	25	5	31.7
155	184	McMaster University	Canada	29	24	9	13	18	19	31.6
156=	101	Curtin University of Technology	Australia	28	18	71	70	12	-	31.5
156=	114	Göttingen University	Germany	32	0	17	17	31	8	31.5
158=	194	Technion - Israel Inst of Technology	Israel	31	17	6	6	23	16	31.4
158=	240	University of Ulm	Germany	12	0	22	16	70	9	31.4
158=	202	Waseda University	Japan	27	24	11	6	42	1	31.4
161=	121	Chulalongkorn University	Thailand	33	18	9	1	33	0	31.2
161=	131	University Louis Pasteur Strasbourg	France	25	15	22	34	28	12	31.2
163	121	Michigan State University	US	28	39	10	12	21	9	31.1
164	219	Saint Petersburg State University	Russia	26	18	1	9	47	1	30.7
165=	76	Brussels Free University (French)	Belgium	30	19	15	39	13	12	30.5
165=	93	China University of Sci & Technol	China	36	14	3	0	24	5	30.5
165=	175	State Univ of New York, Stony Brook	US	26	16	6	15	30	14	30.5
168=	199	George Washington University	US	24	46	3	13	30	5	30.4
168=	136	Tohoku University	Japan	26	0	8	7	31	21	30.4
170=	206	University of California, Davis	US	30	0	2	8	30	17	30.3
170=	260	University of Tübingen	Germany	21	21	21	19	37	9	30.3
172=	172	Aachen RWT	Germany	23	37	24	24	28	4	30.2
172=	157	Maastricht University	Netherlands	18	28	34	46	24	13	30.2
172=	196	Royal Institute of Technology	Sweden	24	11	17	12	43	4	30.2
172=	254	Yeshiva University	US	7	0	9	6	70	20	30.2
176	261	Queen's University	Canada	21	36	38	8	28	7	30.0
177	138	Oslo University	Norway	30	0	17	9	34	5	29.9
178	228	University of Bern	Switzerland	17	9	1	16	54	9	29.8
179	169	Shanghai Jiao Tong University	China	31	37	13	5	19	1	29.7
180	150	Nanjing University	China	35	20	24	2	16	3	29.6
181=	172	Kobe University	Japan	25	17	8	7	38	5	29.4
181=	132	Université de Montréal	Canada	25	25	48	11	13	14	29.4
183=	192	Jawaharlal Nehru University	India	32	14	2	6	27	4	29.3
183=	186	Free University of Amsterdam	Netherlands	25	9	19	8	36	8	29.3
185	289	University of Kebangsaan Malaysia	Malaysia	32	22	9	6	25	0	29.2
186	165	Innsbruck University	Austria	23	0	30	48	32	6	29.1
187=	213	Brandeis University	US	19	23	7	23	34	13	29.0
187=	142	Frankfurt University	Germany	30	17	22	17	19	7	29.0
187=	150	University of Minnesota	US	26	20	8	10	20	16	29.0
190=	240	University of Barcelona	Spain	31	16	2	11	26	4	28.9
190=	248	Reading University	UK	21	19	32	25	30	6	28.9
192=	169	Malaya University	Malaysia	33	14	10	7	24	1	28.6
192=	118	Queensland University of Technology	Australia	33	8	51	19	13	2	28.6
194	154	Technical University of Denmark	Denmark	25	0	19	19	25	17	28.5
195	267	Aberdeen University	UK	20	9	37	25	33	7	28.3
196	308	University of Wollongong	Australia	23	8	69	64	15	3	28.2
197	125	La Sapienza University, Rome	Italy	37	15	2	6	11	5	28.1
198=	254	University of California, Irvine	US	24	16	2	10	19	21	28.0
198=	143	Korea Advanced Inst Science & Technol	South Korea	24	11	14	6	29	12	28.0
200	305	University of Paris-Sorbonne (Paris IV)	France	32	29	6	29	13	0	27.9

Compiled from data by QS and Evidence Ltd

Insiders and outsiders lend a balanced view

The tables on pages 3-5 are the third edition of *The Times Higher/QS World University Rankings*. As in 2004 and 2005, they list the world's top 200 universities according to a range of qualitative and quantitative criteria. Our methodology this year follows that we used in 2005 very closely.

Qualitative and quantitative forms of data each account for half the total score. The qualitative data is based on our belief that the people who know most about university quality are those who work in them or are closely connected to them.

For this reason, 40 per cent of the score allotted to each university is derived from peer review carried out among academics by QS Ltd, partners with *The Times Higher* in compiling the World University Rankings. This has involved gathering data from 3,703 academics around the world. Each was asked which area of academic life — science, medicine, technology, the social sciences or the arts and humanities — they are expert in, and then asked to name up to 30 universities they regard as the top institutions in their area. This is a robust and simple test, and is almost immune to fraud. To achieve this large total of participants, we amalgamated data from our surveys in 2004 and 2005 with this year's responses. However, only the most recent response was used from any individual. In future years, we shall not use data more than three years old.

This peer review shows that, although there are a few dozen universities that are plainly world leaders, there are also well-regarded universities in a surprisingly large variety of countries, in both the rich and developing worlds. Indeed, *Top Universities Guide*, the book that accompanies this supplement, shows that the top 500 universities in the world all have their supporters. The top 200 come from 30 countries, while the top 500 come from 51.

This peer review is enhanced by a further 10 per cent of the score based on the opinion of a vital group of outsiders who observe the world's universities closely. These are graduate recruiters, especially those who

Peer review is once again a key criterion in this year's rankings. But research quality is now gauged on five rather than ten years of citations, making it more topical, says **Martin Ince**

work internationally or on a substantial national scale. The sample includes people from companies in manufacturing, services, finance and transport, as well as from the public sector. They were asked which universities they like to recruit from, a question that we hope reveals something about the quality of the students an institution can attract and the teaching they receive there. We sampled 736 recruiters.

Peer review is the standard way in which the quality of individual pieces of academic work is judged. We believe that applying it to institutions in the controlled way we have done provides an up-to-date measure of the dynamism of whole institutions and of wide groups of subjects in them.

The other half of the rankings scores are made up of quantitative measures. As with the whole of this exercise, the problem is to obtain a measure of university quality that can be calculated on a consistent basis in widely differing environments. This means developing questions that can be answered in a valid and informative way in Norway as well as in Brazil.

Teaching and research are the main activities that occur in universities. Measures designed to capture the quality of these activities account for 40 per cent of the total score in our rankings.

We measure teaching by the classic criterion of staff-to-student ratio. This is captured by asking universities how many staff and students they have, and dividing one by the other. In practice, things are not quite so simple. One complication is to decide exactly who is a student. We ask universities to count people studying towards degrees or other substantial qualifications,

not those taking short courses. Staff numbers, too, can be a matter of opinion. We ask universities to submit a figure based on staff with some regular contractual relationship with the institution. A guest lecturer, however distinguished, should not count. This measure is also prone to subject bias. Teaching people to be surgeons or musicians is inherently more person-intensive than transmitting some other forms of knowledge. But because our analysis deals mainly with large general universities, this variation should even itself out.

The measure of staff-to-student ratio is intended to determine how much attention a student can hope to get at a specific institution, by seeing how well stocked it is with academic brainpower relative to the size of its student body. It accounts for 20 per cent of the possible score.

Our next measure, relating to research, is intended to examine how much intellectual power a university has relative to its size. It is based on citations of academic papers, since these are regarded as the most reliable measure of a paper's impact. The world's accepted authority on citations is Thomson Scientific in Philadelphia, formerly the Institute of Scientific Information. We use data from Thomson's Essential Science Indicators database, processed by Evidence Ltd in Leeds. The ESI concentrates on the world's most highly cited and influential research. Our analysis uses data covering 2001-06. This is a change from the first two editions of the World University Rankings, which used ten years of data. Using five years increases the dynamism and rate of change of this measure, but still provides a statistically valid amount — more than 40,000 papers and more than a million citations each for Texas and Harvard universities, the world's top two generators of scholarship on this measure.

To compile our analysis, we divide the number of citations by staff numbers to correct for institution size and to give a measure of how densely packed each university is with the most highly cited and impactful researchers.



There are well-known problems with citations as a measure of research. One is the underrepresentation of papers in languages other than English in citations data. Thomson is addressing this issue by sampling more journals in Asian and continental European languages. But it is also becoming less of a factor as English becomes the language of choice for academic publishing across the world.

As our introduction on page 2 makes clear, the increasingly international nature of higher education is a key reason for the existence of the World University Rankings. The final 10 per cent of our score is intended to determine how global universities are: 5 per cent is awarded on the basis of the percentage of overseas staff each university has, and a further 5 per cent for its percentage of overseas students. This measure is intended to help mobile staff and students by giving them an impression of how international a university may be. But because this measure counts for only 10 per cent of the total score, it is not possible for an institution to do well in the overall table

on this measure without being excellent in other categories.

There are many measures we do not attempt to capture in these pages. We gather data on universities that teach undergraduates only. This eliminates many high-quality specialist institutions such as Rockefeller University and the University of California, San Francisco, both of which are postgraduate medical institutions.

We have considered a wide range of other criteria, such as graduate employment and entry standards, as possible quality measures. But these have all failed the test of being applicable evenly around the world. For example, a university in a particular country could show poor graduate employment figures because of the state of its national economy, not because it provided a bad education.

Likewise, universities are under pressure to produce spin-off companies and other forms of knowledge transfer. But their success in doing so will depend to a large extent on the economic system in which they are embedded. In the same way, it is

impossible to devise a universal measure for entry standards. However, we are always interested in readers' suggestions for new measures we could consider applying.

We regret that there are no data on Royal Holloway, University of London. We plan to include the institution in the rankings for 2007.

Acknowledgments

The World University Rankings are co-ordinated by **Martin Ince** (martin@martinince.com), contributing editor of *The Times Higher*. He would like to thank **Nunzio Quacquarelli** and **Ben Sowter** of QS (www.qsnetwork.com), **Jonathan Adams** of Evidence Ltd (www.evidence.co.uk) and their colleagues, as well as the staff of *The Times Higher*, for their participation in this project.

Best of British close in on Uncle Sam's finest

Focused research funding and broad international appeal are helping Europe's centres of excellence to gain on their US rivals, suggests **Martin Ince**

The World University Rankings leave no doubt that the US contains the top universities. US institutions fill 11 of the top 20 slots, and they are well represented lower down the table.

But the message of our top 200 is that there is more than one road to academic excellence. In 2004 and 2005, Harvard University, the top institution, was more than 10 per cent ahead of its nearest rival, and both years the runners-up were US universities. This year, the gap has narrowed to less than 4 per cent, and the second and third contenders are European. They are among five European universities in the top 20.

Oxford and Cambridge universities, Europe's top two, are of course medieval establishments that have retained a central role in British life, not least because their

graduates — who range from Isaac Newton to Tony Blair — have been in charge of the country most of the time. They produce top research and are the European pioneers of US-style spin-offs and industrial links.



Erasmus University: most non-Anglophone citations

CAREL VAN HEES/HOLLANDESE HOOGTE

Our analysis shows that as well as being well liked by academics (Cambridge University is top in the world in our peer review) and employers, these universities have a highly international staff and student body. This is not only an academic plus but also allows them to benefit from the higher fees they can charge students from outside the European Union.

The same applies to the other UK universities with high rankings, Imperial College London and the London School of Economics. Another part of the reason for the excellence of these top UK institutions is that the vast bulk of the country's research funding goes to a small number of universities. This is a message that the European Commission has noticed and that informs its plans for a European Research Council.



IPG PRESS/MAX PPP

ECOLE NORMALE SUPERIEURE

The Ecole Normale Supérieure in Paris is one of the great institutions of revolutionary France, a *grande école* created in 1794 to train university and *lycée* teachers for the *agrégation*, the competitive high-level teaching examination.

Today, the school, also known as ENS, is France's elite training ground not only for academics and researchers but also for those seeking careers in the Civil Service, in business or in politics.

Alumni number winners of Nobel prizes and Fields medals and include scientists, philosophers, writers, social

scientists and politicians, such as Louis Pasteur, Jean-Paul Sartre, Michel Foucault, Jacques Derida, Léon Blum and Georges Pompidou. And Samuel Beckett taught there.

ENS has more than 1,300 *normaliens* (pupils selected on the *concours exam*) and students up to doctorate level, and 224 teachers.

In addition to its 150 researchers, it has 1,004 associated researchers from institutions such as the National Scientific Research Centre and the National Medical Research Institute.

About 60 foreign academics visit the ENS annually for about a month, and some 300 international researchers stay for up to two years.

Jane Marshall

But a closer look at our table of top European universities suggests there may be other ways of attaining quality. France's Ecole Normale Supérieure, Paris, is 18th in the world, up from 24 in 2005; it is in fifth place in Europe, making it the Continent's top institution outside the UK. It is less international than its UK rivals and less well regarded by academic peers around the world. Although its graduates occupy many key positions in French business and politics, it has comparatively little prestige with the international recruiters consulted by QS. But it is impressive on staff-to-student ratio and on citations of papers by its staff. On this latter criterion, it is just behind Erasmus University Rotterdam, the leading non-Anglophone university in the world for citations. This is significant because of the known bias of

citations data towards publications in English.

While European universities fill 88 of the top 200 slots, the Continent's top universities are far from evenly distributed. Twenty-nine are in the UK, but the presence of other major EU countries varies widely. Germany and France have ten and seven institutions respectively in the top 200. But both countries have significant public research organisations that employ many of the most cited scientists, reducing the ability of universities to get top slots in our research category.

'Dutch universities are very international; they are also popular with employers and produce much-cited research'

German observers are also more critical than most of the rankings process. Some have made the point that German universities are intended to produce qualified professionals and solid incremental research advances, not compete head to head with Harvard.

Smaller and more internationally focused European nations also come out well in our survey. Both Belgium and the Netherlands (six and 11 respectively in the top 200) are prominent, while Austria and Denmark have three representatives each. As well as being very international, Dutch universities are popular with employers and produce much-cited research. Critics point out that it is simple to be international if one is in a country such as the Netherlands, where several other countries are within a day's drive. But it is still tricky to make the most of the international opportunity geography has offered. Switzerland has seven entrants — the two federally funded institutions, plus five cantonal universities.

More alarming among small European nations is the position of Ireland, which has only one entrant, Trinity College Dublin. Its rise from 111th place in 2005 to 78 today will be a relief to a Government that wants Ireland's universities to match the country's increasing emergence on the European stage. But the real issue is not Trinity's position but the fact that no other Irish university has made it to the top 200, not even University College Dublin.

The real gap in Europe's higher education, however, seems to be in southern Europe. Italy's only entrant, La Sapienza University, appears in 197th place, down 72 places since last year's rankings. Spain manages one new entrant, Barcelona, at 190, replacing the relegated Madrid. These results reemphasise the severe challenges higher education faces in both countries.

EUROPE'S TOP 50 UNIVERSITIES

RANK	WORLD RANK	UNIVERSITY NAME	COUNTRY
1	2	Cambridge University	UK
2	3	Oxford University	UK
3	9	Imperial College London	UK
4	17	London School of Economics	UK
5	18	Ecole Normale Supérieure, Paris	France
6	24	ETH Zurich	Switzerland
7	25	University College London	UK
8	33	Edinburgh University	UK
9	37	Ecole Polytechnique	France
10	39	Geneva University	Switzerland
11	40	Manchester University	UK
12	46	King's College London	UK
13	52	Sciences Po	France
14	54	Copenhagen University	Denmark
15	58	Heidelberg University	Germany
16=	64=	Bristol University	UK
16=	64=	Ecole Polytech Féd Lausanne	Switzerland
18	67	Eindhoven University of Technol	Netherlands
19	69	Amsterdam University	Netherlands
20	70	Soas	UK
21	72	Ecole Normale Supérieure, Lyon	France
22	73	Warwick University	UK
23	75	Basel University	Switzerland
24	76	Catholic Univ Louvain (French)	Belgium
25	78	Trinity College Dublin	Ireland
26	81	Glasgow University	UK
27	82	Technical University Munich	Germany
28	85	Nottingham University	UK
29	86	Delft University of Technology	Netherlands
30	87	Vienna University	Austria
31	89	Lausanne University	Switzerland
32=	90=	Birmingham University	UK
32=	90=	Leiden University	Netherlands
34	92	Erasmus University Rotterdam	Netherlands
35=	93=	Lomonosov Moscow State Univ	Russia
35=	93=	Pierre and Marie Curie Univ	France
37	95	Utrecht University	Netherlands
38	96	Catholic Univ Leuven (Flemish)	Belgium
39	97	Wageningen University	Netherlands
40	98	Munich University	Germany
41	99	Queen Mary, Univ of London	UK
42	102	Sheffield University	UK
43=	105=	Humboldt University Berlin	Germany
43=	105=	Sussex University	UK
45=	109=	St Andrews University	UK
45=	109=	Zurich University	Switzerland
47	111	Uppsala University	Sweden
48	115	University of Twente	Netherlands
49	116	Helsinki University	Finland
50	121	Leeds University	UK

Source: QS

How the land of the free charged right to the top

Well-resourced private universities continue to be world-beaters in technology and science, says **Martin Ince**, despite concern that the clash between knowledge and belief is undermining scholarship

The US is the world's largest economy and has a bigger propensity than any other major nation to spend its wealth on universities. While European Union countries spend on average about 1.1 per cent of gross domestic product on higher education, as does Japan, the US spends 2.6 per cent, an annual total of about \$250 billion (£133 billion).

But although money is the essential input for universities, simply having a lot of it does not guarantee success. Unlike the UK, the US decided long ago not to have a national university system and nobody drives US higher education from the centre. Instead, the managers of individual universities have taken the major role in shaping the system — along, of course, with their world-beating fundraisers.



ALAMY

YALE

Yale University, which breaks into our top five for the first time this year, has one of the broadest

curricula in US higher education, requiring its undergraduates to take at least three classes in each of four groups: languages, culture, social sciences, and science and maths. Students are required to speak a foreign

language and to submit a senior essay or project, unusual in US higher education.

The university also seeks to make itself affordable to the broadest possible range of students.

From the 2005-06 academic year,

families with combined incomes below \$45,000 (£24,000) a year were no longer required to pay towards their children's education, a groundbreaking move that is being watched closely by other universities.

The university is

in New Haven, Connecticut, a small city plagued with problems of urban poverty.

Its economic decline appears to be slowly reversing, helped in part by the role of the university in attracting biomedical and pharmaceu-

tical companies.

Alumni include presidents George Bush and George W. Bush, Clinton and Ford, and Senator Hillary Clinton; actors Jodie Foster and Meryl Streep, and telegraph inventor Samuel Morse.

Jon Marcus

As the table shows, this freedom of action has yielded results. The US has 11 of the top 20 universities in the world, and Harvard University has been top of our rankings in all three years of their publication.

This table is dominated by heavily resourced private universities, led by Harvard and its neighbours in the North-Eastern US such as Yale, Cornell and Columbia universities. They are joined by the Massachusetts Institute of Technology and the California Institute of Technology, which like Imperial College London in the UK have succeeded by dominating fast-growing and high-prestige areas of science and technology. But despite their similar titles, these institutions have different roles. MIT trains future technologists and scientists in large numbers, while Caltech is mainly a research and postgraduate university.

In recent years, many US commentators have bemoaned the comparative collapse of the US state university system, once seen as only slightly less prestigious than the private research universities. Our analysis shows they are right to be concerned. Berkeley, part of the University of California, is among our top institutions but has always been exceptionally well resourced. It is seventh in our rankings this year, having been second in our first edition in 2004. The University of California, Los Angeles, and the University of Texas at Austin, 31 and 32 in the world, are the next public universities we list.

Part of the reason seems to be money. Between 1990 and 2004, the public four-year universities of the US increased the amount they charged undergraduates from \$10,900 to \$15,100 a year in constant dollars. This is a huge sum to European eyes. But over the same period, private non-profit four-year universities upped their resources per undergraduate from \$21,200 to \$29,500. In addition, the big private universities are home to the most lucrative research centres. Johns Hopkins University, 23rd in the world in these rankings, runs the Hubble Space Telescope for Nasa.

However, bigger questions arise about the strength in depth of the US university system. While the US has 2,500 accredited four-year universities, only the top few produce globally significant research, attract attention from international employers or are visible to the internationally oriented academics in our peer review. Having taken 11 of the top 20 places in our rankings, US

universities fall away drastically lower down and account for just 55 of the top 200 compared with 88 for Europe.

In recent years, questions have been raised about just how serious the US is about its role as the world's leading producer of knowledge. Reluctance to use public money for stem-cell research and the power of creationist teaching in schools are commonly cited evidence for these doubts. But the sceptics may be underestimating the diversity of the US, financial and intellectual. In California, the state has stepped in to fund stem-cell research that it would be illegal to support with federal cash. And across the US research and teaching in science coexist with beliefs that might

seem to oppose our basic knowledge of the universe. This means that the US is likely to remain a magnet for the brightest Asian and European students and researchers.

Canada spends about 2 per cent of GDP on education, less than the US but more than any other developed country except Korea. Its success in the rankings reflects this commitment, with two universities, McGill and Toronto, in the top 30 and seven in the top 200. McGill's breadth and international reach make it the most visible of Canada's institutions. It is popular with academics and recruiters, and has an impressive staff-to-student ratio. Its main rivals in Canada are Toronto and British Columbia universities, which appear here in the same league as the top European and US research institutions.

'Questions have been raised about just how serious the US is about its role as the world's leading producer of knowledge'



Nasa's Hubble telescope: run by Johns Hopkins

NORTH AMERICA'S TOP 50 UNIVERSITIES

RANK	WORLD RANK	UNIVERSITY NAME	COUNTRY
1	1	Harvard University	US
2=	4=	Massachusetts Institute of Technology	US
2=	4=	Yale University	US
4	6	Stanford University	US
5	7	California Institute of Technology	US
6	8	UC, Berkeley	US
7	10	Princeton University	US
8	11	University of Chicago	US
9	12	Columbia University	US
10	13	Duke University	US
11	15	Cornell University	US
12	21	McGill University	Canada
13	23	Johns Hopkins University	US
14	26	Pennsylvania University	US
15	27	University of Toronto	Canada
16	29	University of Michigan	US
17	31	UC, Los Angeles	US
18	32	University of Texas at Austin	US
19	35	Carnegie Mellon University	US
20	42	Northwestern University	US
21	43	New York University	US
22	44	UC, San Diego	US
23=	48=	Rochester University	US
23=	48=	Washington University, St Louis	US
25	50	University of British Columbia	Canada
26	53	Vanderbilt University	US
27	54	Brown University	US
28	56	Emory University	US
29	60	Case Western Reserve University	US
30	61	Dartmouth College	US
31	66	Boston University	US
32	77	University of Illinois	US
33	79	University of Wisconsin	US
34	84	Washington University	US
35	88	Pittsburgh University	US
36	99	Pennsylvania State University	US
37	101	University of Southern California	US
38=	102=	Georgetown University	US
38=	102=	Rice University	US
40=	111=	Maryland University	US
40=	111=	Wake Forest University	US
42	123	University of North Carolina	US
43	124	University of Massachusetts Amherst	US
44	127	Purdue University	US
45=	130=	Tufts University	US
45=	130=	Virginia University	US
47	133	University of Alberta	Canada
48	141	UC, Santa Barbara	US
49	145	Georgia Institute of Technology	US
50	150	Texas A&M University	US

Source: QS

Tiger's growl builds up

Asian, Australian and Latin American institutions are strong regional bastions of quality that are keen to join the global high-flyers, says **Martin Ince**

Is Asia emerging as a rival to the US and Europe as home to the world's top universities? The first three years of the World University Rankings provide a mixed response to this complex question.

In each of the three years, Asian institutions have impressed in the rankings. Australia, which we class with Asia in these tables, has a big university system and has done everything it can to raise its impact across mainland Asia and the Pacific Rim. It has been consistently the most prominent, and this year has 13 of the top 200 universities. This may make it the most heavily represented country in these rankings per head of population, apart from micro-states such as Singapore.

But the picture changes when the upper layers of the rankings are examined. In 2004, our top 20 featured four Asian institutions. They were Tokyo in 12th position, the Australian National University, Peking and the National University of Singapore in 16th, 17th and 18th places respectively. This year the same four remain in the top 20, although Peking has replaced Tokyo as Asia's top university according to our criteria.

This suggests that although there are many capable Asian universities lower down our rankings, few institutions in the region are likely to emerge as full-scale rivals to Harvard, Berkeley or Cambridge. For example, Tokyo is indisputably Japan's top institution. It is well regarded by employers and academics, and it produces citations in respectable numbers, but it is not very international — it seems to be an excellent national institution, not a world leader.

Japan musters 11 universities in the rankings, perhaps not an impressive total for the world's second largest economy and one of the most high-technology countries in the world. Its leading universities hope that a shift of emphasis to quality will strengthen

SINGAPORE

The National University of Singapore, founded in 1905, has forged a global reputation since independence from Malaysia in 1965 and now ranks in the top quartile of the world's universities.

The university, set on a 1.5 square kilometre campus at Kent Ridge, which in February 1942 was the scene of the last stand by the Malay Regiment, is a beacon for the huge investment in education at all levels made by the Government of Singapore.

Newly privatised on April 1, 2006, the university continues to receive a state subsidy as the country seeks to maintain the highest all-round standards in education.

Student enrolment is around 23,000, with more than 2,100 faculty. Student intake is from a wide range of countries. In the law school, more than two dozen nationalities are represented, while exchange schemes take Singaporean students to countries that include China, Canada, Australia and the US.

Among its leading graduates the NUS lists Goh Chok Tong, former Prime Minister of Singapore, Kishore Mahbubani, dean of the Lee Kuan Yew School of Public Policy at NUS, and Choo San Goh, Washington Ballet choreographer.

Active on an international level, Singapore plays a leading role in the Association of Pacific Rim Universities, while consolidating its position at the forefront of the International Alliance of Research Universities. Singapore has



five overseas colleges: Bio Valley (US); Silicon Valley; Shanghai; Stockholm; and Bangalore. A recent initiative has seen the NUS enter the film-making world through the establishment of the

NUS Hollywood Lab in co-operation with the University of Southern California School of Cinema and Television.

The university's facilities include six libraries and four museums, the latter including the Raffles

their position as the country's supply of young people dwindles in coming years. But the shrinking number of candidates may damage elite as well as modest institutions.

In contrast, Beijing University's status in the top 20 seems stable. This year's 14th place, up one from 2005, may be only the start of the story. Peking has gained this position despite a poor citations score and

having few international students. China is regarded as a market for other countries' universities, not a place to go to study. It would not be surprising if Peking, which on this showing is Asia's top university, became a magnet for mobile students. If it does, and if its staff produce more highly cited papers in key journals, it could enter the top ten in the next few years.

slowly to a roar



PIC CREDIT

Museum of Biodiversity Research, named in honour of the founder of the British colony, polymath Sir Thomas Stamford Raffles.

The museum holds more than 500,000 specimens

of flora and fauna. The Government's current reorientation of the republic's economy sets goals in new areas such as biotechnology and biomedicine, where the university also plays a leading role.

David Jardine

China has ten entries in the top 200, including four from Hong Kong. By contrast, India, the next most populous nation, manages only three. Of these two, the Indian Institutes of Technology and of Management are both multi-campus institutions. We plan to collect discrete data on their various centres in future years.

Elsewhere in Asia, several ambitious

countries show up only modestly in our rankings. The exception (see box) is Singapore, whose national university comes in at 19. It is accompanied by Nanyang Technological University in position 61. However, Taiwan and Thailand manage only one university each in our rankings and Malaysia two, both modestly placed.

An interesting contrast is Korea, whose flagship institution, Seoul National University, might have been expected to suffer in our rankings from highly visible misdeeds in its stem-cell research programme. In fact, Seoul National rose 30 places, from 93 to 63, between 2005 and 2006, and its main rival, Korea University, is up 34 places to 150. By contrast, the University of Western Australia, which had its biggest ever coup last year with the winning of the Nobel Prize for Medicine, is down 31 places to 111.

There is little doubt that Asian nations want universities that can be ranked alongside top European and North American institutions as an essential driver of economic progress.

The same ambitions can be found elsewhere in the developing world but are being fulfilled more slowly. The National Autonomous University of Mexico is ranked 74th in the world, rising from 195th in our first series of rankings. It is probably the world's largest university by student numbers, but it produces no cited research on the measures we use. It is also the only institution we list from Latin America, Africa or Oceania. São Paulo in Brazil was in our top 200 in 2005 but has now dropped out.

It seems harder than ever for countries such as Brazil or South Africa to assemble the resources needed to sustain a research university. Indonesia, the world's fourth biggest country by population, is also noticeable by its absence from our top 200. However, moves under way in Africa to rank its universities on viable local criteria may allow the continent's top institutions to be identified and to increase their argument for more resources.

'It would be no surprise if Peking, which on this showing is Asia's top university, became a magnet for mobile students'

THE REST OF THE WORLD'S TOP 50 UNIVERSITIES

RANK	WORLD RANK	UNIVERSITY NAME	COUNTRY
1	14	Beijing University	China
2	16	Australian Natl University	Australia
3=	19=	Natl Univ Singapore	Singapore
3=	19=	Tokyo University	Japan
5	22	Melbourne University	Australia
6	28	Tsing Hua University	China
7	29	Kyoto University	Japan
8	33	Hong Kong University	Hong Kong
9	35	Sydney University	Australia
10	38	Monash University	Australia
11	41	Univ of New South Wales	Australia
12	45	Queensland University	Australia
13	46	Auckland University	New Zealand
14	50	Chinese Univ Hong Kong	Hong Kong
15	57	Indian Institutes of Technology	India
16	58	Hong Kong Univ Sci & Technol	Hong Kong
17	61	Nanyang Technological Univ	Singapore
18	63	Seoul National University	South Korea
19	68	Indian Insts of Management	India
20	70	Osaka University	Japan
21	74	Natl Auton Univ of Mexico	Mexico
22	79	Otago University	New Zealand
23	82	Macquarie University	Australia
24	105	University of Adelaide	Australia
25	108	National Taiwan University	Taiwan
26	111	Univ of Western Australia	Australia
27	116	Fudan University	China
28	118	Tokyo Inst Technology	Japan
29	119	Hebrew Univ Jerusalem	Israel
30	120	Keio University	Japan
31=	128=	Kyushu University	Japan
31=	128=	Nagoya University	Japan
33	133	Hokkaido University	Japan
34	146	RMIT University	Australia
35	147	Tel Aviv University	Israel
36	150	Korea University	South Korea
37	154	City University of Hong Kong	Hong Kong
38	156	Curtin University of Technol	Australia
39=	158=	Technion — Israel Inst Technol	Israel
39=	158=	Waseda University	Japan
41	161	Chulalongkorn University	Thailand
42	165	China Univ Sci & Technol	China
43	168	Tohoku University	Japan
44	179	Shanghai Jiao Tong University	China
45	180	Nanjing University	China
46	181	Kobe University	Japan
47	183	Jawaharlal Nehru University	India
48	185	Univ Kebangsaan Malaysia	Malaysia
49=	192=	Malaya University	Malaysia
49=	192=	Queensland Univ of Technol	Australia

Source: QS

Big thinkers presented in pleasingly petit packs

Elite institutions in developed economies find it easier to provide tuition on a personal level

This table shows the world's top ten universities measured by staff-to-student ratio. We regard this measure as a key indicator of an institution's commitment to teaching. While there are many national surveys of teaching effectiveness and student fulfilment, it is hard to measure teaching on a world scale, not least because students are bound to vary in the expectations they have of the courses they take and how they prepare for them.

But we know that students around the world are becoming more picky consumers. And one thing they need to know is how many other students will be competing with them for the attention of each staff member.

On this measure all the top universities are in high-wage economies. Institutions in

RANK	WORLD RANK	NAME	COUNTRY	STAFF/STUDENT SCORE
1	13	Duke University	US	100
2	4=	Yale University	US	93
3	67	Eindhoven University of Technology	Netherlands	92
4	48=	Rochester University	US	91
5	9	Imperial College London	UK	88
6	52	Sciences Po	France	86
7	28	Tsing Hua University	China	84
8	56	Emory University	US	84
9	53	Vanderbilt University	US	81
10	39	Geneva University	Switzerland	81

Source: QS

countries such as Mexico, India or Thailand, where staff can be hired more cheaply than in Europe or North America, seem not to want to press home this advantage by increasing staff numbers, or perhaps cannot afford to do so. The economics of running a university in the developing world seems to demand high student numbers and small staff head counts.

The top two institutions on this measure, Duke and Yale universities in the US, are significant research universities and are in the top 20 in our overall world rankings. Yale, ranked fourth, is also one of the few US universities to have a substantial percentage of international staff by European or Asian standards.

This is one measure in which no country

is dominant. Two European technology universities, Eindhoven in the Netherlands and Imperial College London, appear in third and fifth positions, while Sciences Po in France, a specialist in the social sciences, is also prominent as a comparatively small, elite school. The other European institution here, Geneva University, is maintained by cantonal rather than federal funding, but it has defeated Switzerland's national institutions on this measure.

This table contains only three of the world's top 20 universities overall. On this measure, Cambridge and Oxford emerge in 27th and 31st places, just ahead of Harvard in 37th. Even further behind are California's big players — Stanford University at 119 and the University of California, Berkeley, at 158.

RANK	WORLD RANK	NAME	COUNTRY	CITATIONS SCORE
1	7	California Institute of Technology	US	100
2	1	Harvard University	US	55
3	6	Stanford University	US	55
4	4=	Massachusetts Institute of Technology	US	54
5	32	University of Texas at Austin	US	53
6	44	University of California, San Diego	US	42
7	8	University of California, Berkeley	US	39
8	92	Erasmus University Rotterdam	Netherlands	38
9	18	Ecole Normale Supérieure, Paris	France	37
10	10	Princeton University	US	34

Source: QS and Evidence Ltd

California hits the top spot on good citations

Centres focusing on hard, high-impact research are runaway winners

Oxbridge players are in a class of their own

UK academics make a big impression in the global arena, trouncing the US high-flyers

Because peer review accounts for 40 per cent of a university's possible score in the World University Rankings, the top universities on this criterion tend to be highly placed in our overall table as well as in this one. Here we see the top ten universities in the eyes of academics around the world.

It shows that Harvard University, the top institution overall, is beaten comfortably by Cambridge and Oxford universities on this measure. Its score of 93 out of a possible 100 puts it only just ahead of the University of California, Berkeley, which is often regarded as its biggest rival.

Also conspicuous in this list is the Massachusetts Institute of Technology, which does well on this measure despite its

Which universities have the world's most respected researchers? This table of the top ten institutions for citations gives the answer in the way that the academic community itself measures impact. It shows the top ten universities in terms of the number of citations of their papers, per staff member, recorded over the past five years by Thomson Scientific in its Essential Science Indicators database.

It shows that one institution, the California Institute of Technology, outguns the rest of the world on this score by a almost double. Harvard University, the Massachusetts Institute of Technology and the University of California, Berkeley are left far behind. The reason for Caltech's dominance is clear. It has fewer than 1,000 undergraduates but 1,200 postgraduates and 1,200 academic staff, not including visitors.

TOP 10 FOR PEER REVIEW

RANK	WORLD RANK	NAME	COUNTRY	PEER REVIEW	EMPLOYER REVIEW
1	2	Cambridge University	UK	100	79
2	3	Oxford University	UK	97	76
3	1	Harvard University	US	93	100
4	8	University of California, Berkeley	US	92	75
5	6	Stanford University	US	82	85
6	4=	Massachusetts Institute of Technology	US	81	93
7	16	Australian National University	Australia	72	30
8	22	Melbourne University	Australia	72	44
9	19=	Tokyo University	Japan	72	29
10	4=	Yale University	US	72	81

Source: QS

specialist nature. Its work in fields such as art and languages is on a small scale but it is highly prestigious and visible, allowing MIT to garner votes in disciplines far removed from science and technology.

The overall message is that the world's academics are sceptical about the idea that the US has all the best universities. Cambridge's lead in peer review is convincing. And, on this measure, its ancient rival Oxford is its nearest challenger on the world stage as well as in the UK.

This measure contains only five US institutions. It shows that the big two Australian universities are well regarded around the world, especially the Australian National University, which has been well funded for some decades and is

involved in a full range of research and teaching.

The picture is more complex in Asia. While Peking University shows up well ahead of Tokyo University in our overall rankings, academics still take Tokyo more seriously.

The table also shows how well employers like the universities that most impress academics — and the two measures overlap substantially. Here, Harvard is the world leader, a position it has perhaps achieved by overall excellence supplemented by having the world's most prestigious business school. MIT, Stanford and the London School of Economics (not in this table because it scored only 42 in our peer review) also do well. Tokyo shows poorly on this measure.

And they are concentrated in high-impact areas, mainly science and technology, with a growing emphasis on the life sciences.

Citations analysis is not a process that favours academic diversity. Behind Caltech, this table is dominated by US universities with medical schools because of the ferocious publishing and citation culture of biomedical research. Like Caltech, MIT does not have a medical school, but it brings in substantial income from biomedical research via its life sciences departments. Caltech's life sciences papers had more than 22 citations each in the period under review, ahead of MIT at 20. Princeton University was ranked a distant third, with 15 citations per paper.

Because of the bias of citations in favour of work published in English, the appearance of two continental European institutions here is of special interest. In the

Netherlands, Erasmus University Rotterdam has gained its position by well-cited medical publishing. In France, papers in the natural sciences have allowed Paris's Ecole Normale Supérieure to compete.

Citations are famously unkind to the humanities and social sciences. While the era in which a historian could have a brilliant career by writing three massive books may be ending, the culture of frequent journal articles and citations will probably never catch on there as it has in science and medicine.

There is little valuable citations data for the humanities. But we know that in the social sciences, MIT and Harvard tie as the institutions with the most-cited papers — with an average of just four citations per paper, about a quarter of the figure for the most-cited medical research.

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