

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
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 Tubingen	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.

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.



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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	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.



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

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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.

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.

