



TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS 2013-14



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We identify the world's finest and our transparent, rigorous tables can claim similar status, argues Phil Baty

A refined instrument

This is the 10th year that *Times Higher Education* has published its annual World University Rankings – and we have come a long way in a decade.

Looked at with the benefit of hindsight, those first global rankings in 2004 were painfully rudimentary: they employed just five performance indicators, giving a 50 per cent weighting to subjective opinion expressed in a tiny survey, and a remarkably generous 20 per cent to staff-to-student ratios as a flimsy proxy for teaching quality. Even today, some rankers grab the odd headline and attract the eye of university marketing departments by relying on such simplistic methods.

But times have changed. A decade ago there were about 2.5 million students studying outside their home nations; today the figure is 4 million. Then, about 25 per cent of all research papers in top journals were the result of international collaboration; today, the figure is nearer 40 per cent. According to the Royal Society's *Knowledge, Networks and Nations* report, in 2011 there were more than 7 million researchers globally being funded by a combined research and development spend of more than £650 billion.

Higher education is global, and there is a hunger for richer and more sophisticated data at that level among students and their families to help them decide on study destinations; among academics to inform partnerships and career decisions; among industry authorities to forge investment strategies; and among university and political leaders to illuminate policy.

Here *THE* delivers. With data collected, analysed and verified by Thomson Reuters since 2010, the

THE World University Rankings employ 13 separate performance indicators across the broad spectrum of world-class university activity.

The current methodology was created during 2009-10 after a root-and-branch review of the old simplistic rankings, informed by a global survey of user needs and concerns, open consultation with the sector and detailed input from an expert advisory group. Today's rankings draw on about 50 million journal citations to some 6 million articles and a survey of almost 60,000 respondents since 2010.

So it is fitting that the *THE* rankings, and their growing range of spin-offs, are the most highly regarded by the highest levels of government. For example, Shashi Tharoor, India's minister of state for human resource development, has declared: "*Times Higher Education* is widely seen as the principal yardstick we should look to." Japan's Prime Minister Shinzo Abe has targeted progress in our tables as part of his government's economic plans, and they are used in similar ways in Brazil, Russia and elsewhere.

And transparency is key to what we do: Allan Goodman, president of the independent Institute of International Education, has spoken of our "exemplary" approach to opening up our data to users.

Founded in 1971, *THE* draws upon not only a decade of experience in producing global rankings but also 42 years of serving the higher education community to bring you this vital analysis today.

Phil Baty is editor, *Times Higher Education Rankings*.



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In the place to be

It's clear from the continuing power shift from West to East and the success of Boston that real-world geography still plays a vital role in university excellence, even in the networked age, argues Phil Baty

Power among the world's leading universities has shifted further eastwards, with mainland Europe suffering the worst losses, the *Times Higher Education* World University Rankings 2013-14 show.

In general, this year's tables are marked by their stability: the California Institute of Technology holds on to top spot for the third year in a row; the same institutions make up the top 10 as last year (albeit with some changes in the pecking order); there is minimal movement among the world's top 30; and the two rankings powerhouses, the US and the UK, experience little overall movement at the national level. But one trend stands out: Europe's national flagships are listing.

The premier-ranked institutions in Germany, France, Switzerland, the Netherlands, Russia, Belgium, the Republic of Ireland and Austria all fall down the tables. And although the power shift among nations is less marked than it has been in previous years, the top players in China, South Korea, Japan and Singapore have all risen up the top 200 list.

Asia now boasts six top 50 institutions, up from five last year.

"For several years, national governments in Europe have reduced or frozen investment in higher education and research as a result of the economic crisis – although they have done so while claiming the opposite, given the importance of the sector in the global knowledge economy," says Hans de Wit, professor of internationalisation of higher education at the Amsterdam University of Applied Sciences.

This retrenchment has happened "in a period where elsewhere, in Asia in particular, funding is on the rise, both by public and private means", he adds.

"The irony is that several governments have made reference to the fact that their universities have so far maintained their position in the rankings,

so there was no need for criticism of their lack of investment. This is now coming to the surface."

The UK cements its position as the number one nation in Europe for world-class higher education and the strongest on the planet after the US. It has 31 institutions in the top 200 – the same number as last year – with seven top 50 representatives and 11 in the top 100.

The UK's elite institutions – the University of Oxford (joint second) and the University of Cambridge (seventh) – maintain their positions, and the overall picture for the country is one of stability, with an average drop of just 0.1 place among its top 200 players.

But this stability masks significant movement in both directions at the institutional level: 14 top 200 representatives have risen, 14 have fallen and three have held firm.

Some big names have lost ground: Imperial College London (eighth to 10th), University College London (17th to 21st) and the universities of Manchester (49th to 58th) and Bristol (74th to 79th) have all fallen.



But these disappointing results contrast with a sizeable rise for King's College London (57th to 38th) and the ascent of the University of York, which has broken into the top 100.

In continental Europe, the Netherlands continues to demonstrate extraordinary system-wide success in the rankings, with 12 institutions in the top 200 – the highest tally after the US and the UK. However, as in previous years, no Dutch institution makes the top 50. In addition, seven of its institutions have fallen: its best-ranked institution, Leiden University, slips from 64th to 67th.

However, Maastricht University, one of the biggest risers in last year's tables, continues its impressive trajectory, moving 17 places from 115th and into the top 100.

Germany is the next best represented country in the list, with 10 institutions – one fewer than in 2012-13. Its top-ranked institution, Ludwig-Maximilians-Universität München, falls out of the top 50 this year (48th to 55th), although its fellows do better: Freie Universität Berlin leaps from joint 128th to 86th place, thanks to outstanding performance in research indicators, to be joined in the top 100 by Technische Universität München (87th).

France increases its presence in the top 200 list with an extra representative, Mines ParisTech (193rd), taking its tally to eight. However, more of its institutions have fallen than risen this year (five). Its number one, École Normale Supérieure, drops from joint 59th to joint 65th, while its other top 100 players, École Polytechnique (joint 62nd to joint 70th) and Université Pierre et Marie Curie (81st to 96th), also slump.

Other leading European institutions to lose ground this year include Switzerland's ETH Zürich-Swiss Federal Institute of Technology Zürich,

the world's number one university outside the US and the UK, which falls modestly from 12th to 14th. The Republic of Ireland's Trinity College Dublin declines from joint 110th to joint 129th, and Austria's University of Vienna falls from joint 162nd to joint 170th.

Amsterdam's de Wit says that although some European nations are generally holding firm in national terms, the consistent falls seen among the top-ranked institutions is a serious concern. "The top always is affected faster than the rest as it is more sensitive to the market and the competition. It is more likely that the trend will continue and affect national systems in the coming years, even if the economy recovers and investment increases, because recovery goes very slowly and the competition in Asia continues to rise."

A notable exception to Europe's downbeat performance is offered by the Scandinavian countries: their top institutions are moving on up. Sweden's



Karolinska Institute (joint 42nd to 36th), the Technical University of Denmark (149th to joint 117th) and Finland's University of Helsinki (109th to joint 100th) all improve their positions, while Norway regains a top 200 foothold (the University of Oslo in joint 185th place).

The secret of this relative success is not hard to discern: according to the spring 2013 report of the European University Association's Public Funding Observatory, Sweden, Norway and Denmark were the beneficiaries of the most generous public funding increases in Europe between 2008 and 2012 – all above 10 per cent when adjusted for inflation.

"In Scandinavia the situation is different," de Wit argues. "First because of the slower impact of the crisis, and second because of the continued support for investment in research and education compared with other European countries. So the negative impact is still minor to absent – although one wonders how

long that will last."

Dag Rune Olsen, rector of the University of Bergen, says: "There is a broad political consensus in the Nordic countries that investing in higher education and research is the key to achieving long-term growth as well as addressing global challenges. This commitment is reflected in the stable state funding that enables us to plan on a long-term scale. We believe that this is of utmost importance for quality in research and education."

Overall, the US holds firmly on to its hegemonic position as the world's leading higher education nation. It takes 77 of the top 200 places (up from 76 last year) – including seven of the top 10, 30 of the top 50 and 46 of the top 100 (all slight improvements on last year).

Of the 77, 40 have risen, 33 have fallen and four have maintained their 2012-13 status. However, the US losses are generally bigger than the gains, so collectively its repre-

sentatives in the table have declined by an average of some 1.1 ranking positions.

The US' general stability masks some robust individual performances, and it has been an exceptionally strong year for one remarkable corner of the country – Greater Boston. As well as top 10 places for Harvard University and the Massachusetts Institute of Technology, Boston University has risen four places to joint 50th, its neighbour Tufts University is up seven places to joint 80th, and Boston College climbs 15 places to 135th. Two of the entrants in this year's table are also located in Boston: Brandeis University (joint 164th) and Northeastern University (184th).

Greater Boston's seven top 200 institutions mean that the metropolis has as many representatives in the list as Canada and Australia (seven each).

Philip Altbach, director of the Center for International Higher Education at Boston College, says that the exceptional position of the city

highlights that even in our digitally networked age, "location remains central" when it comes to world-class higher education.

"The Boston area is an attractive place to live – with culture (high and low), museums, good restaurants and other amenities," he points out. "The nexus of knowledge-based industries – biotech, software, healthcare, financial services and others – is integrally related to the academic community. Several university consortia make it easy for academics and students to interact across institutions. And a long history of academic excellence in the area helps."

This powerful geographical effect is strongly illustrated by the top 10, with Boston's Harvard and MIT vying for global supremacy with rivals from the US West Coast: Stanford University (fourth) and the University of California, Berkeley (eighth), neighbours in California's Silicon Valley. It will be significant in terms of US bragging rights that Harvard has swapped places



Pivotal position Tan Chorh Chuan, president of the National University of Singapore

with Stanford this year, although the differences at the top of the table can be (as in elite sport) minuscule: “Harvard’s swimmers had slightly longer fingers than Stanford’s this year,” as one data analyst puts it.

A similar geographical effect is helping one tiny Asian nation make waves in the global rankings: Singapore. The city state’s two top 200 representatives continue their ascent.

The National University of Singapore rises from 29th to 26th and bolsters its growing status by becoming the second strongest university in the Asia-Pacific region (behind the University of Tokyo, which occupies 23rd spot), overtaking Australia’s University of Melbourne in the process.

Nanyang Technological University, thanks primarily to improvements to its research citation score, moves up 10 places to 76th.

Tan Chorh Chuan, president of the National University of Singapore, acknowledges the power of geography at play in its success. “Bold efforts by the Singapore government at developing the country as a global knowledge and innovation hub have led to an exciting and thriving higher education and research landscape,” he says.

“This is facilitated and characterised by the critical mass of top-rated individuals and institutions in broad clusters of disciplines, state-of-the-art

infrastructure and connectivity, deep and extensive partnerships between overseas and local institutions, and the pervasive use of the English language.”

Hong Kong, Singapore’s fierce local rival as Asia’s key global higher education and research hub, has had a less successful year. Its flagship institution, the University of Hong Kong, has bucked the trend among the top East Asian representatives by slipping eight places to 43rd, leaving it only just holding on to third place in the region.

Although the Hong Kong University of Science and Technology (joint 65th to 57th) and the Chinese University of Hong Kong (joint 124th to joint 109th) have both gained ground, the territory has also lost a top 200 representative (the City University of Hong Kong).

By contrast, mainland China continues to progress, albeit slowly.

It still has only two top 200 universities, but they have made further progress in their ambition to rival the West’s best and both can now claim top 50 status. Peking University inches up one place to 45th, while its neighbour Tsinghua University rises two places to joint 50th, consolidating its rapid ascent last year.

There are changes to the pecking order in South Korea. After a very strong performance, Seoul National University has risen 15 places to claim a world top 50 spot (44th) and the Korea Advanced Institute of Science

and Technology has surged to 56th. The republic’s previously top-ranked institution, Pohang University of Science and Technology, has slipped from 50th to 60th.

Seoul National’s president, Yeon-Cheon Oh, links his institution’s success to a number of factors, all underpinned by the greater autonomy granted by the state in 2011.

This flexibility has allowed Seoul National to push interdisciplinary research, developing a “customised research support system” that frees up researchers and departments to conduct “needs-based, creative” work and redouble their efforts to recruit international students.

Asia’s most powerful force, Japan, has had a solid year after previous signs that its regional dominance was waning. Of its five top 200 representatives, only one, Tohoku University (joint 137th to joint 150th), has lost ground. Tokyo has consolidated its position as Asia’s number one, climbing four places to 23rd, while Kyoto University has edged up from joint 54th to joint 52nd.

The results will make encouraging reading for Prime Minister Shinzo Abe, who in June announced ambitious plans to ensure that there are 10 Japanese universities in the top 100 within a decade.

“The Japanese government has rapidly expanded its support for

the internationalisation of Japanese universities in unprecedented ways,” said Shigeharu Kato, director general for international affairs at Japan’s Ministry of Education, Culture, Sports, Science and Technology.

In 2009, the Global 30 project was set up to bolster the Japanese sector’s recruitment of international students. It was followed in 2010 by Reinventing Japan, a programme to encourage international collaboration, and in 2012 by the similar Go Global Japan project.

“It appears that under these initiatives, many universities have succeeded in increasing their presence in the world through their efforts in promoting student exchanges and strengthening their networks with foreign institutions,” says Kato.

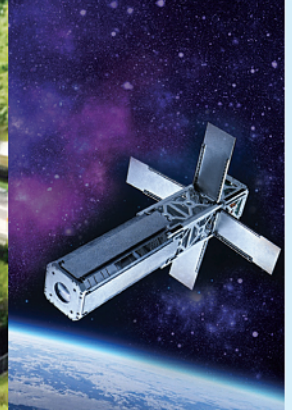
And there will be no let-up in the improvements, he insists. “Prime Minister Abe has put as much priority on education as the economy,” he adds, with universities placed at the heart of the country’s growth strategy.

“Let me underline that the government is committed to supporting Japanese universities in further improving their recognition and reputation in the world,” he says.

With similar sentiments expressed by governments across Asia, it seems that the West-to-East power shift will continue.

NATIONAL REACH

	Top 200 2013-14	Difference to 2012-13
US	77	1
UK	31	0
Netherlands	12	0
Germany	10	-1
France	8	1
Australia	7	-1
Canada	7	-1
Switzerland	7	0
Belgium	5	1
Japan	5	0
Sweden	5	0
South Korea	4	0
Denmark	3	0
Hong Kong	3	-1
China	2	0
Republic of Ireland	2	0
Israel	2	-1
Singapore	2	0
Austria	1	0
Finland	1	0
New Zealand	1	0
Norway	1	1
South Africa	1	0
Spain	1	1
Taiwan	1	0
Turkey	1	1
Brazil	0	-1



NTU. One of the world's fastest-rising universities

A young, research-intensive university, Singapore's Nanyang Technological University (NTU) is one of the fastest-rising universities in the world. Helmed by Professor Bertil Andersson, winner of the Wilhelm Exner Medal, an honour bestowed on the world's best scientists, NTU is a melting pot of international award-winning scientists, young talents and eminent global partners such as BMW and Rolls-Royce. With its state-of-the-art facilities, NTU is building on its interdisciplinary strengths with cutting-edge research that improves lives and shapes the future. NTU now offers medicine at a new school set up jointly with Imperial College London.

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PRIME NUMBERS: THE WORLD'S TOP 200 UNIVERSITIES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	1	California Institute of Technology	US	94.4	98.2	99.8	91.2	65.8	94.9
=2	4	Harvard University	US	95.3	98.5	99.1	40.6	66.2	93.9
=2	=2	University of Oxford	UK	89.0	98.5	95.4	90.3	90.2	93.9
4	=2	Stanford University	US	94.7	96.8	99.1	61.3	68.0	93.8
5	5	Massachusetts Institute of Technology	US	92.9	89.0	100.0	94.3	82.0	93.0
6	6	Princeton University	US	89.9	97.6	99.7	80.5	59.6	92.7
7	7	University of Cambridge	UK	90.6	95.3	95.7	52.8	86.7	92.3
8	9	University of California, Berkeley	US	83.2	97.5	99.3	59.5	57.3	89.8
9	10	University of Chicago	US	85.6	88.2	98.0	-	58.6	87.8
10	8	Imperial College London	UK	84.5	88.1	90.0	72.3	91.8	87.5
11	11	Yale University	US	89.5	90.5	93.5	38.7	57.6	87.4
12	13	University of California, Los Angeles	US	84.8	91.0	95.6	-	46.4	86.3
13	14	Columbia University	US	86.6	79.1	95.6	-	68.0	85.2
14	12	ETH Zürich-Swiss Federal Institute of Technology Zürich	Switzerland	77.6	88.2	85.0	78.8	96.7	84.5
15	16	Johns Hopkins University	US	75.7	85.1	95.0	100.0	59.3	83.7
16	15	University of Pennsylvania	US	79.8	81.2	95.0	45.2	40.6	81.0
17	23	Duke University	US	73.9	73.0	96.7	100.0	50.0	79.3
18	20	University of Michigan	US	70.0	86.2	90.8	53.5	49.5	79.2
19	18	Cornell University	US	72.1	83.8	90.8	35.8	55.6	79.1
20	21	University of Toronto	Canada	73.6	81.5	84.5	45.8	70.0	78.3
21	17	University College London	UK	70.5	77.5	84.1	46.8	90.2	77.6
22	19	Northwestern University	US	70.2	76.0	97.1	61.9	34.4	77.1
23	27	University of Tokyo	Japan	84.7	88.0	69.8	56.7	29.6	76.4
24	22	Carnegie Mellon University	US	63.1	77.4	93.9	52.5	58.1	76.0
25	24	University of Washington	US	65.6	69.2	95.6	43.1	43.2	73.4
26	29	National University of Singapore	Singapore	68.0	77.8	66.4	64.3	94.3	72.4
27	=25	University of Texas at Austin	US	64.7	69.0	91.3	59.6	42.4	72.2
28	=25	Georgia Institute of Technology	US	59.4	68.6	87.9	71.3	67.8	71.6
29	33	University of Illinois at Urbana-Champaign	US	66.0	78.9	79.4	-	41.1	71.4
30	31	University of Wisconsin-Madison	US	69.8	67.7	87.2	51.2	32.3	71.1
31	30	University of British Columbia	Canada	59.9	67.9	83.7	43.1	84.2	70.8
32	39	London School of Economics and Political Science	UK	65.2	74.2	69.2	43.6	81.7	69.8
33	=35	University of California, Santa Barbara	US	47.8	58.2	99.4	86.7	61.8	68.4
34	28	University of Melbourne	Australia	57.1	64.2	80.2	65.1	81.3	68.2
35	34	McGill University	Canada	61.5	68.1	74.5	40.8	77.8	68.1
36	=42	Karolinska Institute	Sweden	58.1	67.7	76.0	68.7	73.2	67.8
37	40	École Polytechnique Fédérale de Lausanne	Switzerland	52.9	48.3	95.9	49.2	98.2	67.7
38	57	King's College London	UK	56.2	56.8	87.6	38.3	86.0	67.6
39	32	University of Edinburgh	UK	56.6	56.9	87.6	42.5	81.5	67.5
=40	38	University of California, San Diego	US	52.0	63.0	96.7	48.4	35.6	67.4
=40	41	New York University	US	65.4	58.4	87.9	29.9	41.8	67.4
42	=44	Washington University in St Louis	US	59.5	52.9	96.4	-	44.6	67.2
43	=35	University of Hong Kong	Hong Kong	61.6	69.9	61.5	56.9	80.3	65.3
44	=59	Seoul National University	South Korea	76.4	79.2	47.3	86.0	29.4	65.2
45	46	Peking University	China	72.3	58.1	62.8	99.9	60.6	65.0
46	47	University of Minnesota	US	61.4	62.7	81.2	-	31.7	64.9
47	=42	University of North Carolina at Chapel Hill	US	57.6	55.3	90.2	39.1	35.0	64.5
48	37	Australian National University	Australia	51.8	65.1	71.2	44.8	91.4	64.4
49	61	Pennsylvania State University	US	55.3	65.9	79.4	60.0	33.7	64.2
=50	=54	Boston University	US	56.5	46.1	95.3	31.1	44.2	63.5
=50	52	Tsinghua University	China	66.8	65.9	59.9	99.9	42.6	63.5
=52	51	Brown University	US	55.4	52.0	91.3	33.5	37.7	63.2
=52	=44	University of California, Davis	US	55.5	56.4	81.2	51.3	53.7	63.2
=52	=54	Kyoto University	Japan	69.5	69.5	58.2	78.7	27.5	63.2
55	48	Ludwig-Maximilians-Universität München	Germany	55.4	54.1	83.3	41.4	56.3	63.1

PRIME NUMBERS: THE WORLD'S TOP 200 UNIVERSITIES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
56	68	Korea Advanced Institute of Science and Technology	South Korea	65.6	60.0	67.0	100.0	34.3	62.9
57	=65	Hong Kong University of Science and Technology	Hong Kong	52.4	59.7	72.3	58.5	77.0	62.5
58	49	University of Manchester	UK	54.5	52.2	77.3	40.8	80.9	62.3
59	53	Ohio State University	US	58.3	52.9	79.4	47.7	48.1	62.0
60	50	Pohang University of Science and Technology	South Korea	54.2	49.0	85.7	100.0	33.8	61.7
61	58	Katholieke Universiteit Leuven	Belgium	48.6	59.9	72.9	99.9	58.6	61.3
62	69	Purdue University	US	53.7	62.5	67.0	-	60.6	60.7
=63	=70	Georg-August-Universität Göttingen	Germany	45.1	48.8	89.6	41.2	51.5	59.9
=63	=65	University of Queensland	Australia	43.4	58.0	73.3	61.0	79.7	59.9
=65	=59	École Normale Supérieure	France	54.6	37.1	87.0	44.7	67.1	59.8
=65	75	Rice University	US	44.1	35.5	99.9	35.2	67.7	59.8
67	64	Leiden University	Netherlands	41.9	53.2	84.2	49.8	58.5	59.4
68	78	Universität Heidelberg	Germany	57.8	44.8	76.0	42.1	61.3	59.2
69	77	Delft University of Technology	Netherlands	55.8	67.3	47.2	100.0	74.2	59.1
=70	=62	École Polytechnique	France	46.3	40.5	82.3	74.0	86.1	59.0
=70	56	University of Southern California	US	58.7	43.2	81.2	34.6	43.4	59.0
72	=62	University of Sydney	Australia	47.4	55.4	66.6	66.3	84.8	58.8
73	=72	Erasmus University Rotterdam	Netherlands	37.8	53.3	81.2	56.0	66.6	58.1
=74	=142	University of Basel	Switzerland	39.1	41.0	81.4	98.5	91.1	57.7
=74	67	Utrecht University	Netherlands	36.3	54.7	82.0	85.6	49.2	57.7
76	86	Nanyang Technological University	Singapore	37.7	54.3	67.5	100.0	91.0	57.2
77	=70	Wageningen University and Research Center	Netherlands	43.1	44.3	74.1	100.0	78.3	56.8
78	76	University of Pittsburgh	US	48.6	45.4	84.4	39.4	29.4	56.7
79	74	University of Bristol	UK	39.6	41.2	84.9	38.0	75.0	56.3
=80	80	Durham University	UK	38.3	38.3	88.2	35.3	76.8	56.1
=80	79	Emory University	US	50.4	31.6	90.8	43.2	42.4	56.1
=80	87	Tufts University	US	46.7	32.1	93.9	39.1	43.4	56.1
=83	83	University of Amsterdam	Netherlands	38.3	54.1	75.0	50.2	58.3	55.9
=83	=94	Michigan State University	US	50.0	49.1	71.5	32.0	52.6	55.9
85	93	Ghent University	Belgium	41.0	48.9	74.9	94.6	49.5	55.5
86	=128	Freie Universität Berlin	Germany	43.8	58.0	64.8	34.4	58.7	55.3
87	105	Technische Universität München	Germany	48.2	35.2	80.7	50.1	63.1	55.2
=88	104	Case Western Reserve University	US	51.0	38.6	82.8	-	35.4	55.0
=88	=106	Vanderbilt University	US	46.8	38.7	86.5	51.0	28.6	55.0
90	=94	University of Notre Dame	US	41.2	34.7	91.8	31.2	47.5	54.7
91	=99	Monash University	Australia	42.5	48.9	65.4	67.0	78.3	54.6
92	88	McMaster University	Canada	35.3	42.7	79.4	86.9	68.0	54.5
93	96	University of California, Irvine	US	37.1	40.8	89.7	44.9	36.4	54.1
94	=99	Humboldt-Universität zu Berlin	Germany	45.6	48.7	68.4	-	54.4	53.8
95	102	University of Rochester	US	42.8	29.9	89.7	41.4	50.7	53.6
96	81	Université Pierre et Marie Curie	France	50.2	26.7	82.3	34.4	65.5	53.5
97	91	University of Colorado Boulder	US	34.2	33.3	97.3	-	40.5	53.4
=98	=89	University of Groningen	Netherlands	36.0	48.6	71.1	87.6	53.0	52.9
=98	115	Maastricht University	Netherlands	33.1	47.1	65.8	98.2	89.1	52.9
=100	109	University of Helsinki	Finland	35.5	46.5	77.8	30.7	51.3	52.6
=100	103	University of York	UK	31.7	33.2	89.4	33.3	73.6	52.6
102	119	Royal Holloway, University of London	UK	30.4	21.2	97.5	33.1	92.6	52.5
=103	98	University of Arizona	US	39.4	44.4	74.6	82.3	38.0	52.4
=103	=99	Rutgers, the State University of New Jersey	US	43.4	50.1	70.4	35.4	31.4	52.4
=103	117	Stockholm University	Sweden	28.6	41.4	88.7	31.5	53.4	52.4
=106	114	Eindhoven University of Technology	Netherlands	37.3	47.9	63.6	100.0	68.7	52.3
=106	84	University of Montreal	Canada	45.7	42.9	59.3	90.9	75.6	52.3
108	97	University of Maryland, College Park	US	39.0	37.2	84.4	32.1	42.4	52.2
=109	121	University of Alberta	Canada	44.6	47.8	59.3	46.8	70.1	52.0
=109	=124	Chinese University of Hong Kong	Hong Kong	45.5	54.7	52.4	46.4	66.9	52.0
111	=106	Uppsala University	Sweden	38.9	49.7	66.4	40.5	57.8	51.9

PRIME NUMBERS: THE WORLD'S TOP 200 UNIVERSITIES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
=112	=110	University of Sheffield	UK	40.6	38.1	72.4	42.7	71.6	51.8
=112	118	University of Virginia	US	49.7	33.9	77.5	49.4	30.2	51.8
=114	85	University of New South Wales	Australia	38.8	50.1	58.0	52.6	83.5	51.7
=114	92	Université Paris-Sud	France	35.9	32.1	86.3	28.8	62.0	51.7
=114	=145	Queen Mary, University of London	UK	31.0	29.2	87.0	37.7	88.0	51.7
=117	139	University of Glasgow	UK	34.5	36.6	79.2	40.8	73.7	51.6
=117	=140	KTH Royal Institute of Technology	Sweden	45.0	41.6	55.6	100.0	86.2	51.6
=117	108	University of St Andrews	UK	36.9	32.2	77.3	40.3	88.8	51.6
=117	149	Technical University of Denmark	Denmark	38.9	26.9	78.7	98.7	77.4	51.6
=121	=110	University of Sussex	UK	29.5	32.2	86.3	31.3	80.1	51.2
=121	=89	University of Zürich	Switzerland	38.0	29.8	78.1	39.2	85.5	51.2
123	82	Lund University	Sweden	30.1	48.6	72.0	33.5	67.4	51.1
124	133	University of Geneva	Switzerland	31.4	33.9	77.2	38.3	96.7	51.0
125	=128	Tokyo Institute of Technology	Japan	52.4	51.4	52.0	67.5	32.1	50.8
=126	113	University of Cape Town	South Africa	26.3	31.0	84.6	85.6	77.2	50.5
=126	=124	Dartmouth College	US	38.5	34.5	83.6	42.3	32.7	50.5
128	=122	University of Florida	US	48.0	49.9	59.9	-	30.9	50.4
=129	=154	RWTH Aachen University	Germany	40.4	31.3	76.0	73.9	55.5	50.3
=129	=110	Trinity College Dublin	Republic of Ireland	33.1	25.2	85.4	30.8	85.9	50.3
131	127	Radboud University Nijmegen	Netherlands	29.7	46.1	73.1	42.5	58.6	50.2
=132	=134	Indiana University	US	45.8	37.0	71.5	-	38.3	50.1
=132	=130	Université de Lausanne	Switzerland	27.3	39.7	74.5	52.7	84.5	50.1
=132	=72	University of Massachusetts	US	40.7	38.9	74.6	52.0	33.1	50.1
135	150	Boston College	US	26.3	26.4	96.2	49.4	54.4	50.0
136	=122	University of California, Santa Cruz	US	25.9	29.1	99.9	-	39.4	49.9
137	=145	Lancaster University	UK	34.8	32.6	75.4	32.2	81.2	49.7
138	116	Aarhus University	Denmark	30.7	46.4	65.8	67.5	67.2	49.6
=139	=184	Colorado School of Mines	US	22.7	27.2	97.1	74.8	47.3	49.5
=139	=142	University of Leeds	UK	34.9	38.2	71.3	42.1	68.5	49.5
141	=124	University of Warwick	UK	39.8	42.4	58.7	34.6	82.9	49.4
142	=134	National Taiwan University	Taiwan	47.1	58.3	47.8	47.1	27.3	49.2
143	=134	University of Utah	US	39.4	36.1	76.6	61.3	25.5	49.1
=144	147	Osaka University	Japan	52.5	47.6	50.4	71.2	27.6	49.0
=144	=140	VU University Amsterdam	Netherlands	33.1	38.8	74.1	59.8	49.2	49.0
=146	148	Arizona State University	US	33.8	35.9	83.6	31.4	28.6	48.9
=146	=130	University of Southampton	UK	33.2	31.4	75.4	38.6	79.1	48.9
=148	=154	University of California, Riverside	US	25.9	25.8	91.8	37.6	62.2	48.7
=148	153	University of Exeter	UK	29.2	32.8	78.3	37.2	76.7	48.7
=150	=130	University of Copenhagen	Denmark	33.9	32.0	73.1	43.0	76.0	48.5
=150	=137	Tohoku University	Japan	51.8	48.1	47.3	85.9	29.3	48.5
152	144	Albert-Ludwigs-Universität Freiburg	Germany	40.1	28.4	71.8	86.6	55.9	48.4
153	=158	University of Birmingham	UK	42.8	39.6	57.5	36.7	72.2	48.3
154	=151	Karlsruhe Institute of Technology	Germany	39.0	33.6	64.8	83.0	61.9	48.0
155	=180	Université Joseph Fourier, Grenoble	France	39.1	27.6	75.6	36.1	57.1	47.8
156	170	École Normale Supérieure de Lyon	France	37.1	35.2	67.7	30.0	63.3	47.5
=157	=151	University of Bern	Switzerland	38.9	31.4	64.3	45.1	78.5	47.4
=157	120	University of Nottingham	UK	38.4	36.3	62.3	39.2	70.3	47.4
159	=156	Texas A&M University	US	43.0	50.2	48.6	47.5	46.8	47.2
160	=174	Georgetown University	US	51.9	25.6	62.3	71.9	43.6	47.0
=161	=187	University College Dublin	Republic of Ireland	27.1	29.0	77.0	33.1	79.6	46.7
=161	169	University of Iowa	US	44.2	31.6	70.4	-	29.3	46.7
=161	=196	University of Leicester	UK	32.5	32.9	66.9	33.7	81.6	46.7
=164	192	University of Antwerp	Belgium	34.5	33.2	64.1	100.0	61.1	46.6
=164	161	University of Auckland	New Zealand	26.7	33.5	67.0	74.5	88.0	46.6
=164	201-225	Brandeis University	US	28.8	24.3	86.5	36.8	50.6	46.6

PRIME NUMBERS: THE WORLD'S TOP 200 UNIVERSITIES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
=164	201-225	Pompeu Fabra University	Spain	27.0	27.1	85.2	37.3	51.7	46.6
168	=190	University of Western Australia	Australia	34.6	34.7	58.0	63.3	88.6	46.4
169	=171	University of Liverpool	UK	31.1	31.2	70.3	37.7	75.0	46.3
=170	=187	University of Twente	Netherlands	32.7	43.8	54.3	81.8	65.5	46.2
=170	=162	University of Vienna	Austria	35.8	36.1	57.4	29.3	89.5	46.2
=172	164	Université Catholique de Louvain	Belgium	30.1	35.3	67.5	57.8	63.4	46.1
=172	=156	Yeshiva University	US	47.3	20.6	77.5	-	25.6	46.1
=174	165	University of Delaware	US	27.0	35.5	73.6	98.1	37.1	46.0
=174	=176	University of East Anglia	UK	27.2	24.0	81.7	29.5	72.3	46.0
=176	198	University at Buffalo	US	40.2	39.3	56.2	39.4	55.4	45.9
=176	226-250	Université Libre de Bruxelles	Belgium	22.7	30.4	77.8	-	77.5	45.9
=178	166	Université Paris Diderot-Paris 7	France	24.0	19.1	90.2	29.1	67.0	45.8
=178	=162	Stony Brook University	US	32.5	22.9	80.3	32.3	57.8	45.8
180	=190	Wake Forest University	US	36.1	21.8	85.1	38.8	23.7	45.7
=181	=171	Universität Bonn	Germany	35.8	20.4	80.7	-	54.2	45.6
=181	=174	Rensselaer Polytechnic Institute	US	30.7	35.5	71.5	65.6	35.6	45.6
183	=193	Iowa State University	US	35.6	32.4	71.5	28.2	38.8	45.5
184	201-225	Northeastern University	US	34.5	19.8	82.0	34.5	48.5	45.4
=185	=193	University of Miami	US	43.2	25.8	71.5	-	32.9	45.3
=185	201-225	University of Oslo	Norway	32.4	33.0	65.4	32.5	70.3	45.3
=185	=171	University of Ottawa	Canada	36.5	34.8	60.6	41.6	62.4	45.3
=188	=176	University of Aberdeen	UK	27.9	26.8	71.3	45.1	83.6	45.2
=188	167	University of Texas at Dallas	US	25.5	28.6	81.2	44.4	46.8	45.2
190	183	Yonsei University	South Korea	44.5	47.0	44.2	70.1	35.0	45.1
=191	=137	Hebrew University of Jerusalem	Israel	42.8	37.0	54.3	33.3	52.9	45.0
=191	=184	University of Illinois at Chicago	US	45.5	34.9	56.2	31.1	43.3	45.0
193	226-250	Mines ParisTech	France	41.6	22.5	62.7	99.1	58.7	44.9
=194	168	George Washington University	US	45.6	26.3	65.9	30.0	36.0	44.8
=194	=176	University of Reading	UK	36.0	34.1	58.7	34.4	70.6	44.8
196	201-225	University of Dundee	UK	22.5	21.4	84.9	46.5	65.7	44.7
197	226-250	Florida Institute of Technology	US	15.9	14.5	99.0	44.7	61.5	44.6
198	=180	Newcastle University	UK	29.7	28.3	68.1	36.9	76.3	44.5
=199	276-300	Boğaziçi University	Turkey	20.5	22.8	88.2	45.9	49.8	44.3
=199	=158	Tel Aviv University	Israel	39.9	48.3	44.8	44.7	43.3	44.3

THE WORLD
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RANKINGS

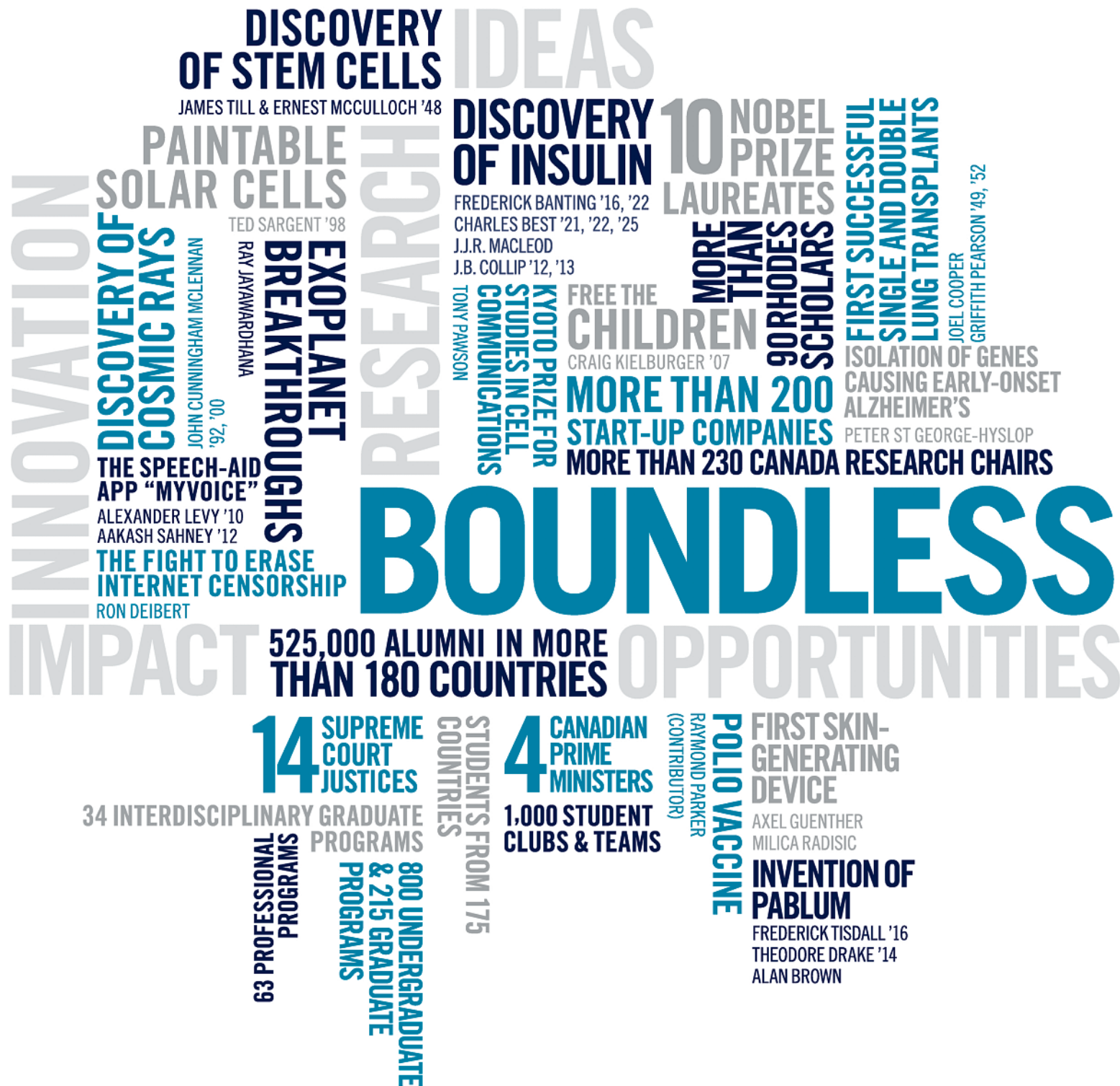
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Continental shifts and drift

For the UK, 14 top 200 institutions have risen, 14 have fallen and three retain their positions

France has increased its representation to eight universities, with Mines ParisTech rising from the 226-250 cohort to 193rd

Europe

Across the continent, flagship institutions have lost ground

With 12 representatives in the top 200, the Netherlands comes third globally after the US and the UK. However, as in previous years, no Dutch institution makes the top 50, and half have slipped down the table

Australia

It has been a tale of disappointment Down Under, with most of its seven representatives falling down the table. To make matters worse, research shows it to be the most expensive place in the world to study, followed by the US and the UK

Only the University of Western Australia has improved its position significantly this year

New Zealand

Note: Countries not drawn to scale

With minimal movement among the world's top 30 institutions and little overall change among US and UK representatives, this year's World University Rankings are characterised by stability. Here we examine the gains (and pains) among elite universities by continent

RANK CHANGE



North America

Canada

US

The California Institute of Technology holds on to the number one spot for the third year in a row

Still the number one nation in the tables, the US performance this year is defined by many small gains (shown in light green) and steeper falls (in darker red). Collectively, its top 200 institutions have fallen by an average of 1.1 places

The Greater Boston area had an exceptional year. Its total of seven top 200 institutions means that the metropolis has as many players in the rankings as Canada and Australia

Asia

With public and private funding on the rise, the number one institutions in China, South Korea, Japan and Singapore have risen up the list. Asia now boasts six top 50 institutions, up from five last year

Singapore's two top 200 players have continued their rise, primarily thanks to improvements in citation, innovation and international outlook scores

China

South Korea

Japan

Taiwan

Hong Kong

Singapore's fierce local rival as Asia's key higher education hub, Hong Kong has had a less successful year. Its flagship, the University of Hong Kong, bucked the regional trend by slipping down the table

Singapore

NEW TO THE TOP 200

Brandeis University, US	=164
Pompeu Fabra University, Spain	=164
Université Libre de Bruxelles, Belgium	=176
Northeastern University, US	184
University of Oslo, Norway	=185
Mines ParisTech, France	193
University of Dundee, UK	196
Florida Institute of Technology, US	197
Boğaziçi University, Turkey	=199



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Brics still finding building blocks

Phil Baty on the patchy performance of the big four developing nations in this year's rankings

The World University Rankings top 200 is unquestionably a rich-world list, dominated by the economic powerhouses of the US, the UK and Western Europe, whose universities – at least until the economic crisis – have been generously supported.

But *Times Higher Education's* “best of the rest” list, naming those institutions that fall between 200th and 400th place in the world (see pages 22 to 28), offer powerful insights into the position and prospects of developing nations – notably the “Bric” nations (Brazil, Russia, India and China), which have prioritised the construction of world-class universities as the key to economic growth.

In all, representatives of 26 countries make the world top 200 – but a further 14 are included in the 200-400 group.

A key feature of the list is the performance of India. In February, Prime Minister Manmohan Singh warned: “Too many of our higher education institutions are simply not up to the mark. Too many of them have not kept abreast with changes that have taken place in the world around us.”

Singh added: “It is a sobering thought that not one Indian university figures in the top 200 universities of the world today.”

In May, *THE* and its rankings data provider Thomson Reuters were invited by India's Ministry of Human Resource Development, its Planning Commission and the British Council to a “national policy dialogue” on rankings and research evaluation.

Speaking at the meeting, Ashok Thakur, secretary of the Department of Higher Education, said that in the past, when faced with criticism about India's failure to feature in the world rankings, the domestic response had been too defensive, with politicians and university leaders complaining that the criteria employed by the league tables were irrelevant to India's national priorities.

“We cannot hide behind that excuse,” he said. “We must play the same game the rest of the world is playing. We need not be shy about it.”

His colleague Shashi Tharoor, minister of state for human resource



development, added: “*Times Higher Education* is widely seen as the principal yardstick we should look to.”

It seems that the message is filtering through. Although no Indian university makes this year's top 200, five institutions from the country are included in the 200-400 tables – up from three last year.

This increased representation is partly a result of improved engagement with the *THE* rankings project. Three institutions are listed this year simply because they chose to submit their data to Thomson Reuters for the first time. The first new entry, Panjab University, makes it into the 226-250 band (India's closest to the top 200). It is followed by four of the specialist Indian institutes of technology, which all appear in the 351-400 cohort: IIT Delhi and IIT Kanpur join IIT Kharagpur and IIT Roorkee, which both featured last year.

Pawan Agarwal, an adviser on higher education to the Planning Commission, says that amid the huge expansion of India's academy, there is

also a concerted drive to improve quality, which gives cause for optimism in term of the rankings.

“As higher education in India expands to meet rapidly growing demand, there is an overriding focus on quality,” he adds. “Accreditation has been made mandatory for all institutions, for which new agencies are being set up and the capacity of existing ones is being enhanced. A system of academic performance indicators has been institutionalised to build a strong performance culture among academics.”

He says that 21 institutions “with potential for excellence” have been earmarked and will have their public funding more than doubled. There is also a “special thrust” to improve the country's science base, with more money for existing institutions plus the creation of five Indian institutes of science, education and research – well-funded institutions designed to replicate the success of the IITs in engineering and technology, but this time in basic science.

“Finally, a system of research evaluation is being put in place,” Agarwal says. “This would bring in selectivity in research funding for about 100 preselected research-intensives to create a competitive landscape for high-end research and promote effective collaboration.”

He concludes: “With all these measures, the country's research performance, which has shown an upswing in recent years, is sure to improve. And it is only a matter of time before all this leads to more Indian universities showing up in the global rankings. Greater awareness and better visibility would perhaps drive more participation and engagement, and see further success for Indian universities at the global level.”

Far less visible in the rankings is the Russian Federation.

Like India, Russia has an explicit mission to boost its position in the rankings: indeed, a decree from President Vladimir Putin demands that

five Russian institutions make the world top 100 list by 2020.

There is still some way to go.

This year, Russia has only one player in the top 400 list: its flagship, the Lomonosov Moscow State University, which has slipped from the 201-225 group into the 226-250 band. It should be noted that two more high-performing Russian institutions would comfortably make the world top 300 but are excluded from the overall rankings for being too narrowly focused (see pages 50-51).

However, the two find places in the subject-specific tables: the Moscow Institute of Physics and Technology takes joint 63rd place (with Moscow State) in the physical sciences ranking, followed by the National Research Nuclear University (MEPhI) in 74th position.

Marina V. Larionova, head of the International Organisations Research Institute at the National Research University Higher School of Economics (HSE) in Moscow, says that the presidential decree “defined enhancing universities’ competitiveness as one of the key higher education developmental objectives in the ever-changing competitive global environment. Entering the top 100 is mentioned as an indication of competitiveness.”

She adds: “This is yet more proof that however imperfect, rankings provide an indication of an institution’s place within the global context.”

To help Russian universities achieve Putin’s target, a number of initiatives are under way – backed by an investment of some Rb9 billion (£175 million) to cover the period 2013 to 2020.

“This year, the Ministry of Education and Science held a tender to support leading Russian universities in developing and implementing strategies to become leading world universities,” says Larionova, who is also head of international programmes at Russia’s National Training Federation.

Selection was based on a range of factors, including the ratio of PhD candidates to overall students, the number of full-time students supported by the federal budget, research expenditure, the proportion of foreign students and the number of research publica-

tions in leading journal databases.

In July, 15 institutions from 54 applications were selected for special support.

Larionova says: “The project will support action plans, which include: measures to attract researchers and management staff with experience of work in leading foreign and Russian universities and research organisations; academic mobility programmes; new PhD programmes; joint bachelor’s and master’s degree programmes; plus fundamental research and applied research carried out in partnership with leading high-tech organisations.”

She adds: “For the Russian government, support to help higher education engage globally is essential. The problem is that this strategy tends to concentrate resources on selected universities, raising the thorny issue of stratification in the country, exacerbating the divide between ‘flagship’ and ‘second-tier’ universities. There is a fundamental issue of equity at stake, a cause for concern for the academic community and society at large.”

Elsewhere in Eastern Europe, performance remains patchy. The Czech Republic’s sole representative, Charles University in Prague, falls from the 301-350 to the 351-400 group; Estonia’s University of Tartu holds firm in the 351-400 bracket; while Poland’s

University of Warsaw has moved from the 351-400 to the 301-350 cohort.

One of the big surprises of the 2013-14 World University Rankings is Brazil’s absence from the top 200 list. The University of São Paulo had been making strong progress, rising 20 places to joint

158th place in 2012-13, but this year it has plummeted into the 226-250 band as a result of lower research impact and reputation scores. Its São Paulo state counterpart, the State University of Campinas, has also lost ground, slipping from the 251-275 band into the 301-350 cohort.

However, despite these slip-ups,



FRESH FOOTHOLDS: ENTRANTS TO 200-400 LIST

Rank	Institution	Country
201-225	Universität Ulm	Germany
226-250	Panjab University	India
251-275	Universität zu Köln	Germany
	University of Nebraska-Lincoln	US
276-300	University of Alaska-Fairbanks	US
	Plymouth University	UK
301-350	Kansas State University	US
	Wuhan University of Technology	China
351-400	University of Bari Aldo Moro	Italy
	China Medical University, Taiwan	Taiwan
	University of Florence	Italy
	Hanyang University	South Korea
	Indian Institute of Technology, Delhi	India
	Indian Institute of Technology, Kanpur	India
	King Saud University	Saudi Arabia
	Liverpool John Moores University	UK
	University of Navarra	Spain
	Old Dominion University	US
	University of Rovira i Virgili	Spain
	San Diego State University	US
	Swinburne University of Technology	Australia



ALAMY



GETTY

Luiz Cláudio Costa, president of Brazil's National Institute for Educational Studies and Research and head of quality evaluation for the Brazilian Ministry of Education, says the country is moving quickly to improve its standing in the rankings.

He points to the results of Sinaes, a national system established in 2004 to evaluate all of Brazil's higher institutions on an annual basis, as proof that standards are rising.

"The results show that the quality of Brazilian higher education has increased significantly in recent years," he says.

Costa also argues that the Science without Borders programme – which is expected to provide 101,000 undergraduate and postgraduate scholarships for domestic students to study abroad over four years and to encourage traffic in the other direction – is allowing "Brazil to meet one of its shortcomings – the internationalisation of its higher education".

He adds: "Moreover, it is noteworthy that Brazil is ranked as the 13th producer of new knowledge in the world, contributing to about 2.7 per cent of indexed scientific output. In addition, investment in science, technology and innovation in Brazil has increased considerably in the past decade. We aim to increase the resources allocated to

the sector from 1.16 per cent of gross domestic product in 2010 to 1.8 per cent by 2014."

Colombia is the only other South American country represented in the rankings, although the University of the Andes, its sole player, has risen impressively from the 351-400 cohort to the 251-275 group – one of the most improved performances in the tables – thanks largely to its gains in research income and impact.

As China has only two institutions in the world top 200 list, its longer-term prospects may be better assessed by looking at the 200-400 group, where it has eight representatives.

The two institutions closest to the top table are Fudan University and the University of Science and Technology of China, which both remain static in the 201-225 group. Renmin University of China moves to the 226-250 cohort from the 301-350 group last year, and Wuhan University of Technology joins the top 400, rising into the 301-350 band. Nanjing University (251-275) and Zhejiang (301-350) hold their positions.

Elsewhere in China, there is less good news: Shanghai Jiao Tong University falls outside the top 300, declining from 276-300 to 301-350. Another

to fall is Sun Yat-sen University, which slips into the 351-400 group.

So why has China not progressed further, given the huge resources at the disposal of its institutions and a state-backed drive to build world-class universities?

"It is not just about funding," says Philip Altbach, director of the Center for International Higher Education at Boston College. "It is about autonomy for academics; it is about effective governance that is much less bureaucratic and top-down than is the pattern in China; it is about full meritocracy; it is about a spirit of cooperation; it is about ending the common practice of academic inbreeding (ie, hiring one's own graduates). The mix of these and other elements constitute the academic culture in China."

He warns: "China has a way to go in terms of developing a vibrant and effective academic culture in its top research universities."

Martin Carnoy, professor of education at Stanford University, has been studying the fortunes of the Bric countries' higher education systems for *University Expansion in a Changing Global Economy: Triumph of the BRICS?*, a book he has co-authored.

"There is little doubt that the

engineers, scientists, doctors and even economists graduating with BA degrees from the top 10 to 15 institutions in the Bric countries are competitive with those graduating from the top 20 US institutions, even if the former are not in the top 100 or 200 in the world rankings," he says.

"The rankings are based mainly on publications in English language journals, not on the quality of the subject matter learned by the students nor on how good the students are in maths and science, or even in creative writing. That said, the quality of the PhDs earned in the Brics, even in the top institutions, is generally lower than in the US, because the quality is highly dependent on research facilities and the quality of research done by faculty."

He stresses that when it comes to the Brics' future strength in the knowledge economy, world-ranked institutions are just one part of a much bigger picture, with success in innovation not directly tied to success in the rankings.

"There may be a strong sense that it is the quality of graduate degrees that drives new knowledge creation and economic growth, but others believe that it is the cultural and financial environment that drives such creativity and harnesses it into new economic activity," Carnoy says.

"Both Brazil and China are putting much more money into research and development than Russia and India, so even if the last two have some of the best trained and most creative engineers and scientists, there is little financial support to turn their creativity into new products and services."

He points out that Finland and Israel, which do not have a single university in the *THE* top 100, are ranked first and fourth in the world (the US and Japan are second and third) in the Martin Prosperity Institute's Global Creativity Index, which ranks countries according to innovation and technology.

"World-class universities are just one element in making a nation an innovation leader," he argues.

Phil Baty is editor, *Times Higher Education Rankings*.

TOUCHING DISTANCE: THE BEST OF THE REST

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook
201-225								
	=176	University of Adelaide	Australia	28.7	34.3	56.8	54.1	78.2
	226-250	University of Bergen	Norway	30.8	28.2	66.6	34.7	62.9
	200	Birkbeck, University of London	UK	31.3	27.4	59.9	29.0	83.5
	226-250	University of Calgary	Canada	32.8	30.2	56.8	45.4	62.9
	201-225	Cardiff University	UK	28.0	30.9	64.6	34.4	70.6
	182	City University of Hong Kong	Hong Kong	30.9	33.5	60.2	55.7	65.9
	201-225	Eberhard Karls Universität Tübingen	Germany	31.1	21.6	71.8	32.3	56.6
	201-225	Fudan University	China	41.6	31.9	54.1	46.7	37.9
	201-225	University of Gothenburg	Sweden	23.4	35.8	64.1	38.0	47.1
	201-225	University of Innsbruck	Austria	25.2	17.2	70.6	40.2	91.4
	276-300	Istanbul Technical University	Turkey	26.2	19.2	82.3	68.2	35.7
	199	Johann Wolfgang Goethe-Universität Frankfurt am Main	Germany	28.9	20.4	80.7	39.8	56.4
	226-250	Korea University	South Korea	46.2	42.2	41.1	70.3	35.5
	226-250	Laval University	Canada	37.7	29.1	59.3	68.5	54.0
	201-225	Middle East Technical University	Turkey	39.2	30.0	56.4	57.0	31.2
	201-225	Nagoya University	Japan	37.4	32.1	55.1	80.6	28.0
	201-225	St George's, University of London	UK	20.5	22.9	84.1	30.6	57.3
	201-225	University of Science and Technology of China	China	38.7	26.1	69.6	69.4	25.8
	201-225	University of Strasbourg	France	25.2	21.1	76.6	32.0	69.2
	201-225	Sungkyunkwan University (SKKU)	South Korea	37.6	38.8	45.8	98.6	33.7
	=193	Technion Israel Institute of Technology	Israel	35.1	37.2	48.9	36.2	59.7
	251-275	Tokyo Metropolitan University	Japan	19.3	9.6	100.0	31.0	29.4
	276-300	University of Trento	Italy	27.2	22.9	71.5	42.8	54.7
	-	Universität Ulm	Germany	38.6	20.6	68.4	51.1	54.6
	=196	University of Victoria	Canada	18.1	28.5	75.5	30.1	67.0
	=184	William & Mary	US	37.2	18.5	73.6	31.9	26.0
226-250								
	201-225	Autonomous University of Barcelona	Spain	30.6	28.0	64.2	39.1	48.3
	201-225	University of Barcelona	Spain	24.5	24.7	74.9	30.3	45.0
	226-250	Bilkent University	Turkey	24.4	26.0	69.2	46.6	43.7
	226-250	University of Cincinnati	US	31.8	22.3	69.3	36.5	25.4
	201-225	Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany	32.7	16.5	71.8	47.5	49.6
	226-250	Georgia Health Sciences University	US	47.2	12.1	63.5	-	30.8
	251-275	Christian-Albrechts-Universität zu Kiel	Germany	29.7	22.7	69.5	39.8	44.2
	201-225	Universität Konstanz	Germany	27.0	30.7	59.9	59.5	58.9
	201-225	Lomonosov Moscow State University	Russian Federation	54.4	36.6	27.0	72.2	55.7
	251-275	University of Milan-Bicocca	Italy	25.2	23.3	76.0	35.3	42.8
	226-250	University of Otago	New Zealand	24.6	26.9	56.9	37.6	84.8
	-	Panjab University	India	25.8	14.0	84.7	28.4	29.3
	201-225	Queen's University	Canada	36.2	29.5	51.6	63.5	59.8
	301-350	Renmin University of China	China	35.5	13.4	69.6	40.4	48.4
	=158	University of São Paulo	Brazil	47.2	50.8	29.4	40.1	24.9
	226-250	Simon Fraser University	Canada	22.0	27.9	66.7	41.8	58.4
	226-250	Technische Universität Darmstadt	Germany	37.6	30.7	43.3	88.0	66.3
	201-225	Tilburg University	Netherlands	32.0	45.7	39.0	55.5	57.6
	251-275	University of Trieste	Italy	19.1	15.0	86.7	32.9	49.8
	226-250	Tulane University	US	43.0	20.6	61.1	-	29.0
	276-300	University of Turin	Italy	26.1	20.9	72.7	41.9	39.7
	251-275	Vienna University of Technology	Austria	39.2	30.8	40.9	66.6	72.4
	226-250	University of Waterloo	Canada	28.9	37.4	47.7	38.5	62.0
	226-250	University of Western Ontario	Canada	37.3	33.7	45.1	52.3	62.7
	251-275	Westfälische Wilhelms-Universität Münster	Germany	30.0	18.2	70.7	39.5	45.1
	226-250	University of Witwatersrand	South Africa	22.4	29.3	55.8	99.0	68.2
	226-250	Universität Würzburg	Germany	27.1	16.0	77.0	30.4	47.4

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TOUCHING DISTANCE: THE BEST OF THE REST

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251-275								
	351-400	University of the Andes	Colombia	14.5	10.5	89.3	30.6	55.7
	301-350	Brunel University	UK	21.6	19.1	64.6	34.1	89.1
	251-275	Dalhousie University	Canada	32.6	28.8	50.3	67.1	59.1
	251-275	University of Essex	UK	30.6	30.5	47.6	32.7	82.4
	251-275	Hong Kong Polytechnic University	Hong Kong	28.4	35.7	48.4	40.3	62.6
	251-275	University of Iceland	Iceland	12.5	24.3	71.1	78.5	59.9
	-	Universität zu Köln	Germany	29.7	18.7	63.6	-	53.4
	301-350	Medical University of Vienna	Austria	25.9	15.9	68.3	33.7	69.4
	276-300	Université Montpellier 2	France	23.4	24.7	67.7	33.4	54.2
	251-275	Nanjing University	China	36.8	23.2	52.6	51.8	50.8
	251-275	National Chiao Tung University	Taiwan	37.3	42.1	37.3	99.5	28.9
	226-250	National Tsing Hua University	Taiwan	39.5	35.4	44.7	43.4	21.5
	-	University of Nebraska-Lincoln	US	32.6	30.0	52.4	34.2	42.0
	276-300	University of Newcastle	Australia	21.2	28.2	58.0	74.2	70.5
	251-275	Norwegian University of Science and Technology	Norway	32.2	26.7	52.9	46.2	54.2
	301-350	University of Pavia	Italy	27.9	20.0	66.7	63.3	40.5
	276-300	Queen's University Belfast	UK	26.9	22.8	53.8	48.5	87.5
	301-350	Sharif University of Technology	Iran	29.7	37.2	49.0	98.3	20.7
	276-300	University of South Carolina	US	34.6	27.9	56.2	31.5	34.4
	276-300	Swedish University of Agricultural Sciences	Sweden	29.0	23.9	59.3	99.8	45.2
	276-300	Technische Universität Dresden	Germany	28.7	15.0	71.8	38.4	49.5
	301-350	Vrije Universiteit Brussel	Belgium	30.0	24.9	59.3	44.7	54.4
276-300								
	-	University of Alaska-Fairbanks	US	26.1	25.5	57.4	52.5	38.2
	276-300	University of Bath	UK	26.7	25.2	50.1	35.0	77.4
	276-300	University of Bologna	Italy	30.7	18.6	64.2	33.5	40.7
	226-250	Carleton University	Canada	19.4	24.1	66.7	-	57.5
	226-250	Chalmers University of Technology	Sweden	26.2	34.8	44.3	77.3	61.5
	276-300	Colorado State University	US	28.6	29.8	57.4	38.5	31.4
	301-350	Creighton University	US	41.3	10.9	68.2	-	21.7
	301-350	University of Fribourg	Switzerland	25.9	16.3	57.6	30.6	84.5
	201-225	University of Georgia	US	39.6	28.9	46.1	30.7	35.0
	276-300	University of Kansas	US	33.9	19.8	59.9	35.9	33.6
	226-250	Koç University	Turkey	16.6	17.1	72.1	41.1	57.8
	251-275	Macquarie University	Australia	20.9	23.8	54.2	37.9	91.1
	251-275	University of Milan	Italy	25.7	19.8	65.5	39.0	35.6
	276-300	University of Montana	US	29.5	15.0	74.6	34.5	22.6
	-	Plymouth University	UK	16.4	16.0	75.4	28.9	48.3
	301-350	Polytechnic University of Milan	Italy	28.6	25.0	56.3	75.9	36.4
	251-275	Queensland University of Technology	Australia	26.6	32.3	44.0	65.3	67.9
	226-250	University of South Florida	US	24.1	31.1	52.4	95.0	38.5
	276-300	University of Southern Denmark	Denmark	18.5	18.3	64.7	70.9	66.4
	276-300	Tokyo Medical and Dental University	Japan	43.3	21.1	52.0	46.6	22.0
	301-350	University College Cork	Republic of Ireland	27.2	20.1	56.8	50.0	67.1
	251-275	Victoria University of Wellington	New Zealand	19.7	27.7	52.9	46.4	82.9
	276-300	Virginia Polytechnic Institute and State University	US	33.7	40.4	38.7	42.0	27.5
	301-350	University of Wollongong	Australia	22.8	25.2	49.1	59.6	83.9
	301-350	York University	Canada	24.2	28.1	55.5	36.2	55.3



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TOUCHING DISTANCE: THE BEST OF THE REST

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook
301-350								
	351-400	Aalborg University	Denmark	20.0	24.5	46.0	39.8	70.8
	251-275	Aalto University	Finland	26.9	17.0	57.4	39.4	64.3
	276-300	Aberystwyth University	UK	19.3	17.6	57.5	32.8	65.5
	301-350	Autonomous University of Madrid	Spain	24.5	19.4	55.0	33.4	46.0
	276-300	Bangor University	UK	20.6	23.2	50.1	30.7	68.8
	276-300	Universität Bayreuth	Germany	22.8	12.7	66.0	–	54.1
	276-300	Universität Bielefeld	Germany	22.8	17.9	59.9	35.8	46.9
	301-350	University of Canterbury	New Zealand	18.2	24.4	51.6	52.3	88.0
	301-350	Université Claude Bernard Lyon 1	France	21.2	16.3	61.4	33.3	50.6
	251-275	University of Connecticut	US	36.1	22.8	49.9	31.7	38.7
	301-350	University of Crete	Greece	18.2	16.6	65.6	35.0	47.1
	351-400	Deakin University	Australia	16.6	18.7	54.2	31.1	73.4
	276-300	Drexel University	US	33.9	15.0	56.2	32.5	38.2
	301-350	University of Eastern Finland	Finland	23.8	18.6	56.1	33.4	39.7
	351-400	Heriot-Watt University	UK	24.7	20.8	39.0	44.3	87.8
	351-400	University of Hertfordshire	UK	14.1	10.2	66.9	30.3	81.1
	301-350	Hokkaido University	Japan	41.0	28.3	32.3	44.2	24.6
	301-350	Hong Kong Baptist University	Hong Kong	20.7	13.9	65.3	30.2	59.5
	351-400	University of Houston	US	37.0	23.8	42.4	36.9	31.5
	–	Kansas State University	US	26.1	15.5	57.4	38.7	34.1
	351-400	Keele University	UK	19.4	19.4	58.7	30.4	71.2
	351-400	King Mongkut's University of Technology, Thonburi	Thailand	13.0	10.5	75.4	62.2	24.4
	301-350	Kyushu University	Japan	38.6	28.0	30.9	75.0	24.5
	351-400	Lehigh University	US	28.9	16.0	53.7	39.7	35.7
	351-400	Université de Liège	Belgium	25.1	16.4	47.0	60.7	67.1
	301-350	Linköping University	Sweden	20.6	26.0	55.6	–	50.2
	301-350	University of Manitoba	Canada	30.8	29.3	45.1	52.8	40.0
	226-250	University of Missouri	US	32.6	31.4	44.9	31.1	28.9
	301-350	Murdoch University	Australia	16.7	16.0	51.7	49.9	86.4
	301-350	National Cheng Kung University	Taiwan	31.5	40.7	27.6	100.0	24.9
	301-350	National Sun Yat-Sen University	Taiwan	27.3	32.6	43.2	45.0	22.1
	301-350	National University of Ireland, Galway	Republic of Ireland	24.5	21.0	50.6	45.7	69.5
	276-300	Oregon State University	US	25.7	19.7	63.5	31.6	35.4
	301-350	University of Padua	Italy	19.3	17.3	70.4	32.0	38.9
	301-350	University of Pisa	Italy	20.3	18.1	64.2	41.7	35.0
	351-400	University of Salento	Italy	31.0	20.4	48.2	51.2	37.4
	301-350	Sapienza University of Rome	Italy	27.0	25.2	48.2	36.3	36.3
	276-300	Shanghai Jiao Tong University	China	35.7	31.8	32.3	79.2	22.8
	301-350	University of South Australia	Australia	22.5	21.8	40.2	83.2	80.0
	251-275	State University of Campinas	Brazil	41.3	37.5	27.9	49.0	19.0
	301-350	State University of New York Albany	US	23.8	26.2	58.7	–	33.9
	251-275	Stellenbosch University	South Africa	24.7	29.3	47.1	95.9	46.7
	301-350	University of Tampere	Finland	23.1	22.2	52.3	45.6	33.9
	351-400	University of Technology, Sydney	Australia	22.1	22.0	47.8	36.4	87.3
	301-350	University of Tsukuba	Japan	36.6	20.9	48.9	35.3	32.6
	251-275	Umeå University	Sweden	19.8	29.6	53.1	30.5	50.1
	301-350	University of Vermont	US	26.6	19.3	57.4	–	21.0
	301-350	University of Waikato	New Zealand	18.4	18.1	56.9	46.3	82.4
	351-400	University of Warsaw	Poland	18.7	14.3	71.1	28.3	42.8
	301-350	Washington State University	US	28.4	26.5	46.1	55.6	35.2
	301-350	Wayne State University	US	35.3	15.7	59.9	–	28.2
	–	Wuhan University of Technology	China	14.8	7.8	78.1	58.7	18.9
	301-350	Zhejiang University	China	35.9	32.1	36.5	94.5	21.0



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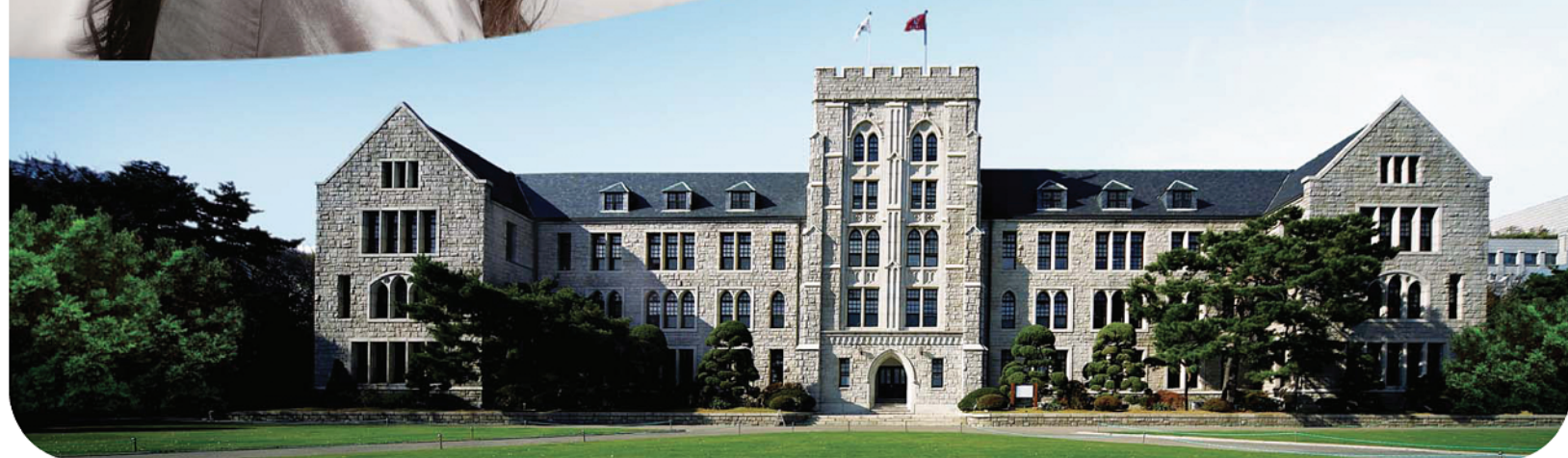
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Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook
351-400								
-	-	University of Bari Aldo Moro	Italy	26.8	21.1	48.2	34.9	34.7
351-400	-	Charles Darwin University	Australia	17.9	18.6	49.1	35.5	58.9
301-350	-	Charles University in Prague	Czech Republic	29.1	19.9	43.6	29.0	53.2
-	-	China Medical University, Taiwan	Taiwan	18.9	28.1	46.2	60.8	20.5
351-400	-	Universität Duisburg-Essen	Germany	20.4	12.0	59.9	41.7	47.7
351-400	-	University of Ferrara	Italy	15.4	14.4	64.2	38.5	38.6
-	-	University of Florence	Italy	17.7	13.2	57.7	34.2	37.3
351-400	-	George Mason University	US	24.5	18.0	54.9	28.8	37.3
301-350	-	University of Guelph	Canada	20.6	22.6	45.1	47.8	39.1
-	-	Hanyang University	South Korea	30.4	27.7	26.9	55.3	42.9
-	-	Indian Institute of Technology, Delhi	India	33.8	23.0	38.5	-	15.3
-	-	Indian Institute of Technology, Kanpur	India	31.3	25.2	41.8	42.4	17.3
226-250	-	Indian Institute of Technology, Kharagpur	India	39.3	30.0	35.3	-	14.7
351-400	-	Indian Institute of Technology, Roorkee	India	25.1	12.3	53.6	64.8	15.6
301-350	-	Johannes Kepler Universität Linz	Austria	20.0	15.3	51.0	41.9	57.7
351-400	-	University of Jyväskylä	Finland	27.5	16.3	47.2	-	42.8
301-350	-	Karl-Franzens-Universität Graz	Austria	24.6	14.4	51.0	29.5	59.9
301-350	-	King Abdulaziz University	Saudi Arabia	18.2	9.4	58.2	39.7	74.3
-	-	King Saud University	Saudi Arabia	21.4	21.1	32.3	93.9	72.2
351-400	-	Leibniz Universität Hannover	Germany	30.9	15.4	39.5	42.7	47.2
-	-	Liverpool John Moores University	UK	14.9	12.5	57.5	28.8	58.1
351-400	-	Loughborough University	UK	30.5	27.9	22.8	42.6	65.4
301-350	-	University of Maryland, Baltimore County	US	16.9	15.0	65.9	32.6	34.4
351-400	-	University of Minho	Portugal	17.2	18.6	50.3	37.4	46.9
351-400	-	National Central University	Taiwan	22.6	22.1	46.2	83.9	34.5
351-400	-	National Taiwan University of Science and Technology	Taiwan	25.5	40.4	33.0	47.9	21.6
351-400	-	National University of Ireland, Maynooth	Republic of Ireland	24.9	20.9	34.6	33.0	70.3
-	-	University of Navarra	Spain	27.3	23.4	33.7	86.2	45.7
351-400	-	University of Oklahoma	US	34.1	14.7	46.1	35.2	26.7
-	-	Old Dominion University	US	21.3	14.3	58.7	-	30.2
351-400	-	Polytechnic University of Valencia	Spain	20.9	13.1	59.0	39.8	28.2
351-400	-	University of Porto	Portugal	20.5	17.8	47.6	36.7	43.9
301-350	-	University of Portsmouth	UK	13.7	11.8	56.3	29.1	73.3
-	-	University of Rovira i Virgili	Spain	19.0	13.6	64.2	30.6	34.3
276-300	-	Ruhr-Universität Bochum	Germany	27.8	20.9	42.0	45.2	50.9
-	-	San Diego State University	US	15.0	23.1	61.1	29.2	22.2
351-400	-	University of Stirling	UK	19.0	22.6	50.1	30.3	62.8
301-350	-	Sun Yat-sen University	China	29.4	18.2	48.1	43.4	25.5
351-400	-	University of Surrey	UK	31.1	22.7	25.7	40.3	83.5
-	-	Swinburne University of Technology	Australia	17.0	19.4	49.1	46.7	68.5
351-400	-	University of Tartu	Estonia	20.3	21.2	46.2	30.3	43.7
351-400	-	University of Tasmania	Australia	18.7	16.7	49.1	36.9	69.9
351-400	-	Temple University	US	35.4	15.0	42.4	-	22.4
301-350	-	University of Tromsø	Norway	20.3	15.8	54.2	39.2	59.6
351-400	-	University of Valencia	Spain	16.6	12.4	59.0	31.7	39.3
351-400	-	University of Vigo	Spain	19.7	10.7	62.9	38.2	25.9
351-400	-	University of Wyoming	US	18.9	28.6	46.1	29.6	29.7

Universities are listed in alphabetical order in bands of 25 or 50. In some cases, where institutions have the same overall ranking scores at the threshold between bands, more than the stated number of institutions appears in a band. Fewer institutions will accordingly appear in the subsequent banded group.



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That's the way to do it How the rankings are created



Teaching
(The learning environment)

30%

The World University Rankings provide the most accurate system of analysis available to delineate the finest universities. Here we present a closer look at the methodology

The *Times Higher Education* World University Rankings are the only global university performance tables to judge research-led universities across all their core missions – teaching, research, knowledge transfer and international outlook. We employ 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons, which are trusted by students, academics, university leaders, industry, even governments. The methodology for the 2013-14 World University Rankings is identical to that used since the 2011-12 tables, offering a year-on-year comparison based on true performance rather than methodological change.

Our 13 performance indicators are grouped into five areas: **TEACHING** (the learning environment); **RESEARCH** (volume, income and reputation); **CITATIONS** (research influence); **INTERNATIONAL OUTLOOK** (staff, students and research); and **INDUSTRY INCOME** (innovation).

Exclusions

Universities are excluded from the *Times Higher Education* World University Rankings if they do not teach undergraduates, if they teach only a single narrow subject, or if their research output amounted to fewer than 1,000 articles between 2007 and 2011 (200 a year) (see page 50). In exceptional cases, institutions below the 200-paper threshold are included if they have a particular focus on disciplines with generally low publication volumes, such as engineering or the arts. Further exceptions to the threshold are made for the six specialist subject tables (see pages 52 to 64).

Scores

To calculate the overall rankings, “Z-scores” were created for all datasets except for the results of the academic reputation survey. The calculation of Z-scores standardises the different data types on a common scale and allows fair comparisons between different types of data – essential when combining diverse information into a single ranking. Each data point is given a score based on its distance from the mean average of the entire dataset, where the scale is the standard deviation of the dataset.

The Z-score is then turned into a “cumulative probability score” to arrive at the final totals. If University X has a cumulative probability score of 98, for example, then a random institution from the same data distribution will fall below the institution 98 per cent of the time. For the results of the reputation survey, the data are highly skewed in favour of a small number of institutions at the top of the rankings, so in 2011-12 we added an exponential component to increase differentiation between institutions lower down the scale, a method we have retained.

Data collection

Institutions provide and sign off their institutional data for use in the rankings. On the rare occasions when a particular data point is missing – which affects only low-weighted indicators such as industrial income – we enter a low estimate between the average value of the indicators and the lowest value reported: the 25th percentile of the other indicators. By doing this, we avoid penalising an institution too harshly with a “zero” value for data that it overlooks or does not provide, but we do not reward it for withholding them.

Reputation survey
15%

Thomson Reuters carried out its latest reputation survey in spring 2013. It examined the perceived prestige of institutions in research and teaching. The responses were statistically representative of global higher education's geographical and subject mix.

Staff-to-student ratio
4.5%

Doctorate-to-bachelor's ratio

2.25%

**Doctorates awarded
to academic staff ratio**
6%

As well as giving a sense of how committed an institution is to nurturing the next generation of academics, a high proportion of postgraduate research students also suggests the provision of teaching at the highest level that is thus attractive to graduates and effective at developing them. This indicator is normalised to take account of a university's unique subject mix, reflecting that the volume of doctoral awards varies by discipline.

Institutional income
2.25%

This measure of income is scaled against staff numbers and normalised for purchasing-power parity. It indicates an institution's general status and gives a broad sense of the infrastructure and facilities available to students and staff.

Research (Volume, income and reputation)

30%

Citations (Research influence)

30%

International outlook (Staff, students and research)

7.5%

Industry income (Innovation)

2.5%

Reputation survey 18%

The most prominent indicator in this category looks at a university's reputation for research excellence among its peers, based on the responses to our annual academic reputation survey.

Research income 6%

Research income is scaled against staff numbers and normalised for purchasing-power parity. This is a controversial indicator because it can be influenced by national policy and economic circumstances. But income is crucial to the development of world-class research, and because much of it is subject to competition and judged by peer review, our experts suggested that it was a valid measure. This indicator is fully normalised to take account of each university's distinct subject profile, reflecting the fact that research grants in science subjects are often bigger than those awarded for the highest-quality social science, arts and humanities research.

Research productivity 6%

We count the number of papers published in the academic journals indexed by Thomson Reuters per academic, scaled for a university's total size and also normalised for subject. This gives an idea of an institution's ability to get papers published in quality peer-reviewed journals.

Our research influence indicator is the flagship, the single most influential of the 13 indicators. It looks at the role of universities in spreading new knowledge and ideas.

We examine research influence by capturing the number of times a university's published work is cited by scholars globally. This year, our data supplier Thomson Reuters examined more than 50 million citations to 6 million journal articles, published over five years. The data are drawn from the 12,000 academic journals indexed by Thomson Reuters' Web of Science database and include all indexed journals published between 2007 and 2011. Citations to these papers made in the six years from 2007 to 2012 are also collected.

The citations help to show us how much each university is contributing to the sum of human knowledge: they tell us whose research has stood out, has been picked up and built on by other scholars and, most importantly, has been shared around the global scholarly community to expand the boundaries of our collective understanding, irrespective of discipline. The data are fully normalised to reflect variations in citation volume between different subject areas. This means that institutions with high levels of research activity in subjects with traditionally high citation counts do not gain an unfair advantage.

We exclude from the rankings any institution that publishes fewer than 200 papers a year to ensure that we have enough data to make statistically valid comparisons.

International to domestic student ratio 2.5%

The ability of a university to attract undergraduates and postgraduates from all over the planet is key to its success on the world stage.

International to domestic staff ratio 2.5%

Research 2.5%

In the third international indicator, we calculate the proportion of a university's total research journal publications that have at least one international co-author and reward higher volumes.

This indicator is normalised to account for a university's subject mix and uses the same five-year window as the "Citations: research influence" category.

A university's ability to help industry with innovations, inventions and consultancy has become a core mission of the contemporary global academy. This category seeks to capture such knowledge transfer activity by looking at how much research income an institution earns from industry, scaled against the number of academic staff it employs.

The category suggests the extent to which businesses are willing to pay for research and a university's ability to attract funding in the commercial marketplace – useful indicators of institutional quality.

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* Source: Survey of 263 admissions officers at U.S. universities, of which 212 accept both the **TOEFL**[®] test and the **IELTS**[®] test and 152 state a preference.

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Upward mobility

Dirk Van Damme
considers the most
improved universities
in the rankings

What is the profile of the institutions that will most warmly welcome the publication of the 2013-14 World University Rankings? When considering the data, 36 members of the top 200 in 2012-13 have improved their positions by 10 or more places this year. These could be considered to be the “winners” in terms of jockeying for position, with their profiles potential blueprints for ambitious peers to follow.

First of all, national contexts matter: the winners come from countries that already do well in the top 200, with 11 hailing from the US, five from the UK and four from Germany. Other European countries have 10 universities moving up 10 places or more.

The resilience of already successful national higher education systems to generate up-and-comers is remarkable. Of the 10 universities climbing 25 places or more, we find one in the US, two in the UK, two in Germany and one each in France, Denmark, Belgium, Switzerland and the Republic of Ireland.

Many higher education observers share the view that European countries offer far less dynamic university environments than the US. However, the 2013-14 World University Rankings prove the opposite: relative to the size of the system, the highest upward (and downward) movements are seen in Switzerland, Germany, France, Sweden and Denmark; Switzerland's University of Basel is the most extreme case, jumping no fewer than 68 places. The relative chance of being a winner is 14 per cent in the US and 16 per cent in the UK, but no less than 40 per cent in Germany and Sweden, and 25 per cent in France.

Asian countries find their way on to the list, too: South Korea has two

winners and Hong Kong and Singapore one each. The dynamism of South Korea's system is demonstrated by four representatives in the top 200, two of which are winners. However, Japan and China are absent from the list.

Winners are predominantly “sub-toppers” – the group just outside the top 50. The median rank of the 36 winners is 111th and only three have been able to penetrate the top 50.

It is in the dynamic sub-top that universities have been able to distinguish themselves from their peers and move up the rankings with a sufficiently mighty leap.

Obviously, at the absolute top there are ceiling effects: the higher up the rankings you go, the smaller the differences. King's College London, which jumps 19 places to 38th, is the highest ranked winner.

Winners generate their upward

mobility mainly by significantly improving their score in one or two of the five broad areas assessed by the overall World University Rankings. Of the 36 institutions, 22 are among the 63 universities that show the biggest improvements to their scores in either the teaching, research, citations or internationalisation categories, and four are among the top 20 most improved in two area scores. The three with the most improved teaching scores – King's College, Université Joseph Fourier, Grenoble and Basel – all make it on to the winners list.

However, the most significant impact on upward mobility is made by research impact (citations), where the winning institutions have been able to differentiate themselves to the greatest degree from their nearest rivals.

Between 2012-13 and 2013-14, the

winners have been able to increase their scores in this area by 1.41 points on average. At the top of the list we find Germany's Freie Universität Berlin and Singapore's Nanyang Technological University. Such institutions have clearly understood that improving their citation output is the best route to rankings success.

The top 200 winners specialise – but not too much. The blueprint does not demand improving a lot in one area and neglecting the others: rather, it requires significant improvements in one measure or more while safeguarding performance in the rest.

Dirk Van Damme is head of division at the Centre for Educational Research and Innovation, the Organisation for Economic Cooperation and Development.



Watchwords for improvement

Diversification and specialisation are driving movement in the tables, Dirk Van Damme finds

Universities today – including the top ones – face tougher competition in a period of shrinking resources. The economic crisis and austerity policies in many countries have had a serious impact on institutions' capacity to engage in the global campaign for academic excellence. This in turn seems to have affected the dynamics of the 2013-14 *Times Higher Education* World University Rankings.

The ability of universities to rise up the tables has decreased: the average movement in the top 200 in 2013-14 is 0.08 place, compared with 0.4 in 2012-13.

What dynamism there is seems confined to the lower end of the table.

Beyond the rather static top 50, the rest of the top 200 is now in the grip of the dynamics of global competition. It may be unsurprising that countries that have suffered less during the economic crisis, such as Switzerland, Germany, Belgium and Sweden, have more successfully nurtured the conditions to allow their universities to move up the rankings. But this is no hard and fast rule: University College Dublin, which has made one of the most significant jumps in the table this year (up 26 places), demonstrates that troubled national circumstances do not inevitably condemn individual universities to stagnation and decline. Institutional policies and strategies matter, too.

Universities under increasing stress are forced to choose their priorities and specialise. Those at the absolute apex are excellent in all areas: that is precisely the condition necessary to reach the very top.

The elite have high functional cohesion across all the areas assessed by the rankings: teaching (the learning environment); research (volume, income, reputation); citations (research influence); industry income (innovation); and international outlook (people, research). But outside the top 20, differentials in the scores for the first three become increasingly vital.

Even universities that rise in the

tables because of better overall scores than their competitors may show significant decreases in one area.

This signals a tendency for increasing specialisation and policy prioritisation. As a result, the internal cohesion of universities in the "sub-top" group (from about 50th place to 100th) is decreasing. It reaches a low point around the 100 mark and then increases again towards the lower segments of the top 200, where universities become more functionally homogeneous, albeit at a more mediocre level.

Institutional specialisation has its price, of course.

Consider those institutions in the sub-top group that have excellent scores for citations (research influ-

ence). They have, on average, relatively low teaching scores. Interestingly, they also tend to have low marks for research (volume, income, reputation), while universities with excellent scores on this same measure perform well on citations (research influence) scores.

The explanation is, again, specialisation: universities making strategic choices to focus on key subject areas might end up with lower general research scores while still improving their research impact.

Changes at the institutional level parallel those seen nationally, with the latter shaping decision-making at the former. The result is

that countries not only have different strengths and weaknesses across the various areas of assessment but also manifest divergent patterns of change.

Take the US, for example. On average, its universities do better than the overall top 200 on teaching, research and citations. US institutions' citation scores are particularly strong: 18 of the top 20 performers in the table hail from the US.

This general level of quality and impact explains the country's pre-eminence in the global rankings.

But for international outlook, US universities traditionally have scored badly. However, it is remarkable to see that American universities, while maintaining their relative positions in

CITATIONS: SEEDS OF DIVERSITY?

Up there with money, scientific knowledge is one of the world's fastest-moving elements.

The internet, collaborative research technologies and advances in communications have dramatically increased the potential for research findings to fuel scientific progress in research and teaching globally.

Consequently (but somewhat naively), many observers conjectured that academic excellence, traditionally concentrated in the US and the UK, would follow suit and spread to many countries across the world.

This is not exactly what has happened. Countries aspiring to break the Anglo-Saxon monopoly in academic excellence have so far found that even huge investment in their universities has not yet allowed them to reach the top. The secrets of building world-class universities seem hard to learn.

Despite persistent attacks on their academic hegemony, the US and the UK have successfully preserved their top positions in the global academy.

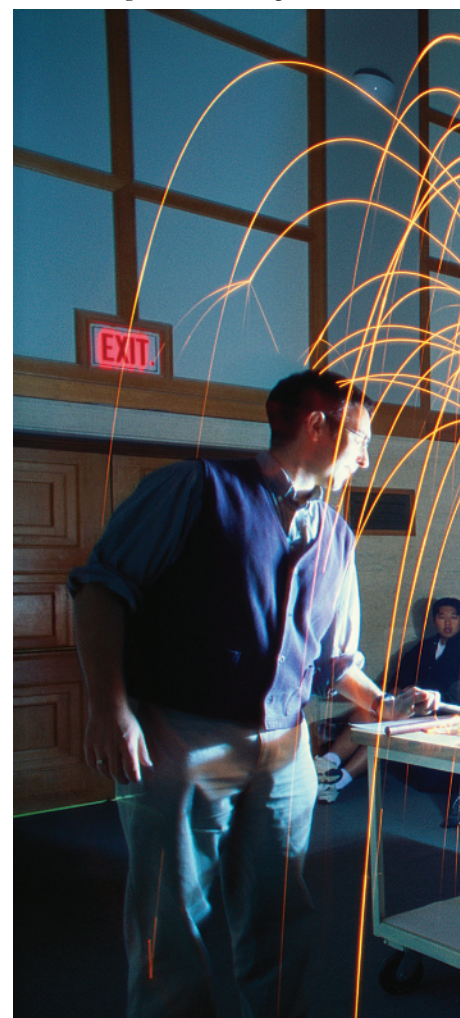
However, a more dynamic picture emerges when we focus on the most improved universities in any of the five areas on which the overall World

University Rankings are based. Taking the 20 most improved examples in teaching, research, citations, industry income or international outlook leaves us with a list of 63 institutions.

Although the list is still dominated by the US (with 27 representatives), seeds of diversity in one key area are readily apparent.

The most dynamic of the five assessment areas is the citations (research influence) score. This tough measure of research impact demonstrates growing diversity: of the 20 top improvers in this area, only two are American and four are British – and they are not top of the list. Rather, it is Germany, Singapore, Sweden and South Korea that lead the pack, with seven other countries also represented.

So in the core area of the academic knowledge system – research impact – the dynamics of globalisation have started to shake things up. For sure, it will take a long time before other functional areas of the academic system follow. Nevertheless, the seeds of geographical diversity in academic excellence are being sown in the heart of the system.



teaching, research and citation scores, also drastically improved internationalisation attainment between 2012-13 and 2013-14. It seems that they have understood that their global position and the risk of declining market share for international students necessitate the development of institutional internationalisation policies. Of the 20 most rapidly improving universities for international outlook in the top 200, 15 are American.

As a result, the functional cohesion of US universities has also improved. It is this resilience in the face of emerging deficiencies that explains the robustness of US higher education, regardless of the rest of the world's aspirations. Its universities

are not passively holding on to their monopolies, but are fighting hard to maintain their position against all comers.

Other countries have different profiles: take the UK. Its universities on average maintain high international outlook scores, which testify to the nation's policy priorities (despite the Home Office's stance on migration and visa policies). They also combine high citation scores with average teaching and research attainment.

However, the UK system is rather dynamic. It has a higher proportion of universities rising or falling in the rankings than the US. Some of its

middle-ranked institutions demonstrate huge improvements in teaching, research or citation scores, but the improvement is not general and across all functional domains. As a consequence, it is clear that the internal functional cohesion of UK universities is decreasing as a result of growing diversification.

Although they share a number of features with the UK, continental European countries also follow different routes. Nordic countries, the Netherlands, Belgium and France have relatively low scores for teaching and (with the exception of the Netherlands) research. In general, these scores have not improved significantly year on year.

However, European countries are focusing on improving their citation output and are doing so successfully – it is the major factor in rises in position for their universities. The exception is France, which faces a decrease in its citation scores and, hence, the rankings. Even the two French institutions that have risen more than 10 places overall in this year's tables have done so despite serious relative losses in citation scores.

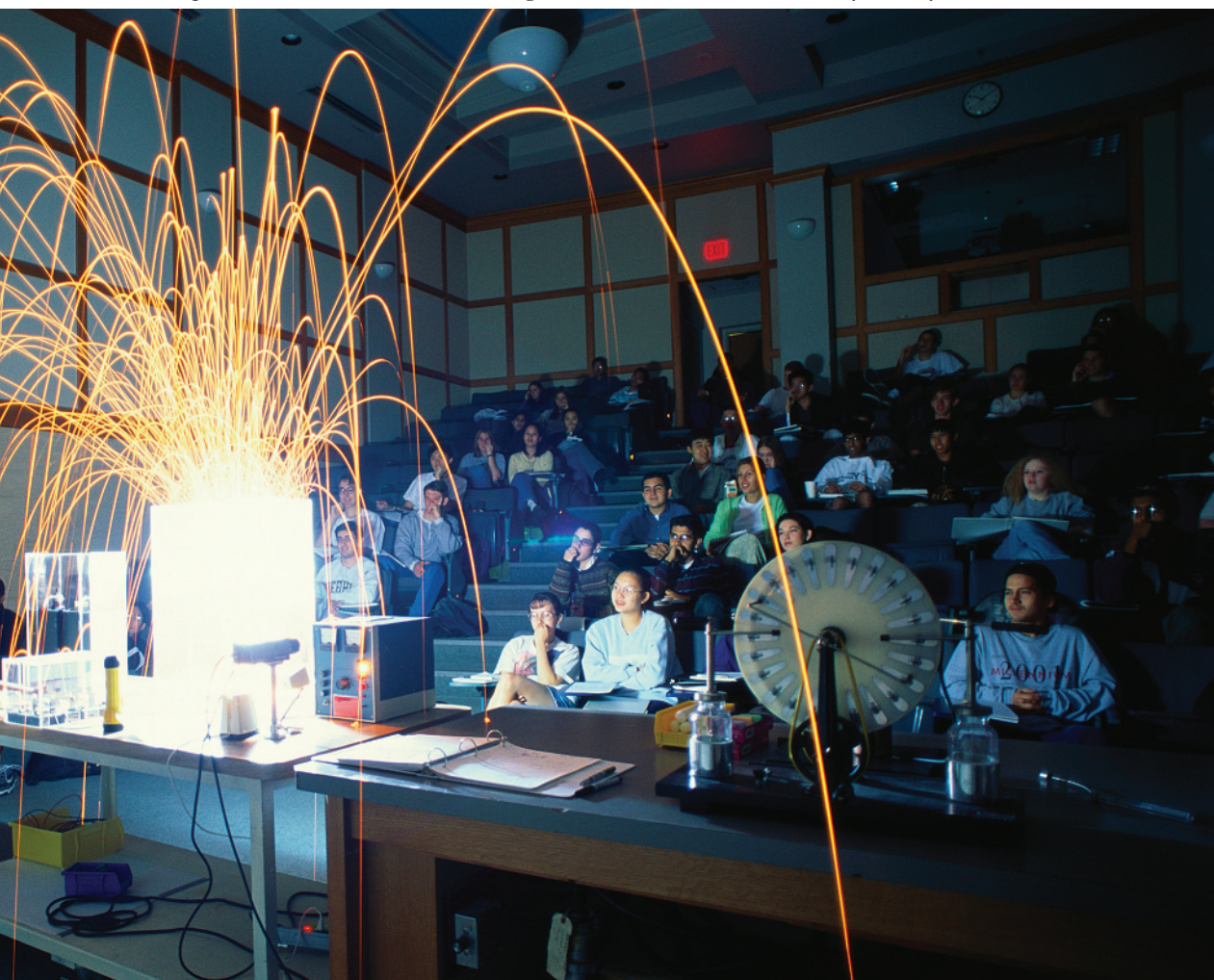
In contrast, of the 20 most improved universities according to this measure, eight hail from other European countries. As a result, it is clear that traditionally very cohesive European universities have started to internally diversify, too.

Asian universities have excellent teaching and research scores, often higher than those of their US and UK competitors. Their main problem is that their average citation scores continue to lag behind the anglosphere's: despite huge investment and the fact that some Asian universities are among the top 20 for the most rapidly improving research impact profiles, citations do not seem to have increased sufficiently.

However, Japanese and South Korean universities continue to build on their pedagogic advantages.

In contrast to other parts of the world, diversification and specialisation do not seem to be top priorities for Asian universities: the internal cohesion of Japanese, Korean and Chinese institutions in the top 200 list vastly increased between 2012-13 and 2013-14. However, this policy of improvement across the board does seem to fall short when compared with global competition based on diversification and specialisation.

Dirk Van Damme is head of division at the Centre for Educational Research and Innovation, the Organisation for Economic Cooperation and Development.



Fresh view of pale blue dot

Phil Baty and Benjamin Hennig put the rankings results into human and economic perspective

It is clear that the world's best universities are overwhelmingly concentrated in the developed world (with most of the top 200 found in North America and Western Europe), but these two heavily distorted world maps are designed to put the results of the *Times Higher Education* World University Rankings 2013-14 into a clearer global context.

The images – known as gridded cartogram transformations – look at the top performing universities in relation to the size of each country's population (the top map) and economic productivity measured by gross domestic product (the bottom map).

The maps have been created exclusively for *THE* by Benjamin Hennig, senior research fellow at the School of Geography and the Environment at the University of Oxford, who says they put the rankings “into the perspective of the human and economic shapes of the world”.

Consider the population map. The land area is resized so that each space in the map relates to an equal number of people no matter where you look. Sparsely populated spaces shrink in size, highly populated areas expand, while the underlying grid ensures that the geographic location of each area is preserved. This allows us accurately to map the locations of the top 200 universities into these transformed spaces.

On this map, the pink circles represent *THE*'s world-ranked institutions. The largest circles represent universities in the top 25, while the smallest represent those ranked from 151st to 200th.

In the GDP map, the land area is resized so that each space relates to an equal amount of output, so less economically active areas (as measured by GDP, not by people's real activity) shrink. Here, the blue circles represent *THE*'s world-ranked institutions but according to their overall scores (not their rankings positions, as with the population map). The largest blue circles represent those institutions scoring between 90 and 100 points overall, with the smallest representing those scoring under 50 points.

Hennig says: “In the wealthy parts of the world, we see a more even distribution of the top academic institutions, while at the same time the GDP map shows that there are some more clustered patterns even in the ‘developed’ world when it comes to their locations in relation to economically active spaces.

“Huge global inequality becomes highly visible in these maps, as they do not show land area, but rather where people live and work – and where they are more excluded from access to ‘top’ education, even in the emerging economies and most populated countries of China and India.”

Gridded population cartogram
2013 rank

- 1 to 25
- 26 to 50
- 51 to 75
- 76 to 100
- 101 to 150
- 151 to 200

Gridded GDP cartogram
Overall score

- <50
- 51 to 60
- 61 to 70
- 71 to 80
- 81 to 90
- 91 to 100



Innovation is in the air – and ever

Jean-Lou Chameau on the essential ecology of science and technology universities

As in previous years, the 2013-14 *Times Higher Education* World University Rankings will be noted and celebrated – or criticised. Among the plethora of academic rankings, *THE*'s have gained significant respect and (whether we agree with them or not) influence.

Until recently, I spent my entire academic career in the US, including leadership positions as dean of engineering and then provost of the Georgia Institute of Technology, and then president of the California Institute of Technology. In the summer I left Caltech, a well-established and prestigious institution, to assume the presidency of King Abdullah University of Science and Technology (KAUST), a “start-up” in Saudi Arabia.

Because of my background, *THE* invited me to reflect on my experience at leading universities with a focus on science and technology.

Such universities historically have played an integral role in the innovation, economic development and prosperity of a region or country. In the latter part of the 19th century and with the emergence of mechanised agriculture, transport and industry, such institutions were founded with the explicit intent to enable and drive economic development. Georgia Tech, for example, was established in 1885

to foster manufacturing, specifically the textile industry.

Over time, the landscape for science and technology universities has evolved into an innovation ecosystem in which the institutions not only support industry and educate a highly qualified workforce, but also lead innovation and create new industries themselves. Silicon Valley, with the University of California, Berkeley and Stanford University acting as its innovation engines, remains the leading model of such endeavours. There are other examples, at different scales and in diverse national contexts, all founded with high expectations for long-term technological and economic development. Not all of them will become Silicon Valley, however.

One can argue that any science and technology programme makes positive contributions. The simple fact that its graduates readily find employment, even in difficult economic times, speaks to that argument. However, the degree of institutional effectiveness and impact on the innovation and prosperity of a region vary significantly. Why? There are scholars who dedicate their entire careers to answering such questions, but I will suggest some reasons here.

Success is highly dependent on the educational ecosystem. California's innovation is not built on a few elite academic programmes alone, but on a network of institutions, both private and public – from major research universities to community colleges and vocational training programmes – that provide the education and manpower necessary to fuel the state's knowledge- and innovation-driven economy. *THE*'s rankings spotlight the elite's success; however, it should be noted that their impact is enabled by a complex system of institutions.

A key element for success is a relentless commitment to excellence in education and research. This implies encouraging and enabling highly talented people to address important questions with passion. In this regard,



Caltech is an exemplar: spend one day on the Caltech campus visiting laboratories and meeting faculty and students, and you will feel this unusual drive to make a difference. There is something in the air there that is difficult to explain.

Another ingredient is having the discipline to focus. In an era of increasingly complex and expensive research facilities, intense competition and limited resources, most science and technology research programmes cannot be the best, or even good, at everything. Focus also speaks to the need for partnerships and the development of cross-disciplinary teams with talent and special skills within a global research network. The world's best

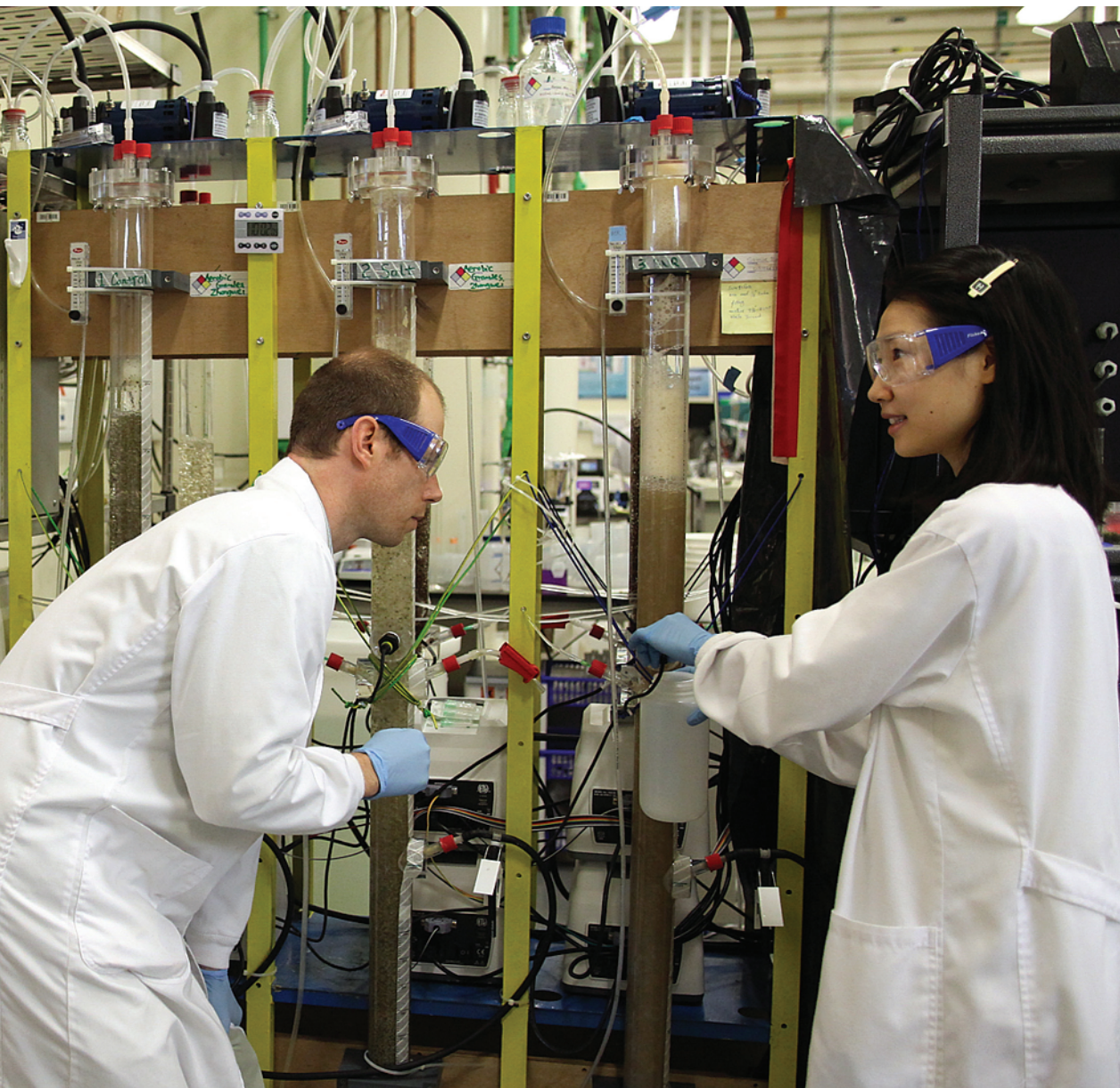
programmes will seek partners, including institutions that may be competitors in other fields.

A thriving science and technology university supports exploration and innovation: the former encompasses both curiosity- and problem-driven research; the latter translates this into products, technologies and processes. Curiosity-driven research does not provide instant gratification (by this, I mean the shorter-term returns on investment often expected by investors or the taxpaying public). It is risky and often long term, but it is also the source of most great discoveries with the potential to spur dramatic technological advances.

The culture supporting technology



ywhere else, too



(and knowledge) transfer from the university to the innovation ecosystem is also critical to success. Even in the US, few get it right. The infrastructure for technology transfer is one necessary aspect, but it is not sufficient.

At Caltech and Georgia Tech, there is synergy between the drive for discovery and the desire to address societal problems. This is hard to prescribe as the former may be inherent in the people you recruit. However, it is fuelled by a world-class collaborative research environment combined with an agile operational structure that welcomes interaction with diverse stakeholders in the economic arena. Under these conditions, success breeds success, reinforcing the culture.

I began by saying that investment in any science and technology programme will likely have positive effects. Most of us will agree that the most significant contribution will result from the superior education of students – the young engineers, scientists and entrepreneurs we need in our communities. Great programmes place students in a creative environment where they learn not only to analyse and solve difficult questions, but also to tune their analytical skills by synthesis and understanding of the broader context in which societal problems exist. The best also place their students in a diverse, international and entrepreneurial community.

Students in leading science and

technology institutions receive a high-quality education that confers privileges and, if we do our jobs well, the appreciation that these privileges come with the duty to contribute to the betterment of society. A thriving innovation ecosystem not only shapes their education, but also makes it easier for them to give back to society.

As I reflect on my experiences, I realise that the character of the best science and technology institutions formed the basis of my decision to join KAUST. The university was established to promote social prosperity and economic development, not only for the Kingdom of Saudi Arabia but also for the world.

As a completely new institution, it is unencumbered by academic history and is able to focus on interdisciplinary areas of research that are critical to the world, including food, water, energy and the environment.

KAUST is providing flexible and sustained resources to its academics and students to ensure that they can focus their energy and passion on important questions, both curiosity- and problem-driven. From day one, it positioned itself as a collaborative, diverse and international campus with partners from all over the world. Furthermore, the work of the faculty is enabled by first-class facilities and a supportive infrastructure, as well as a technology transfer programme and a technology park.

While KAUST's commitment to sustained research support and infrastructure provides the context for a new centre of discovery and innovation, its culture will be the foundation of its success. A brand-new institution can select from among the world's best practices and experiment in areas that may be difficult, or even impossible, to consider in established ones: from having a faculty development and promotion process without tenure, to providing a holistic community environment with all the social amenities and services that scholars, students and staff need for their families within walking distance of the campus' core. KAUST is recruiting exceptional faculty, staff and administrators committed to developing a culture of excellence and innovation, not only in research and education but also in the way its employees work and live.

Having led one of the world's leading science and technology institutions and contributed to the ascendancy of another, I appreciate the challenges we all face in our mission to create a more prosperous society. Benchmarks such as the *THE* World University Rankings provide an opportunity for reflection on the status of our respective institutions, and also provide a glimpse into the evolution of the world's innovation ecosystem.

Jean-Lou Chameau is president, KAUST, and president emeritus, Caltech.

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May you lead in interesting times

Peking's pedagogic approach is training captains to navigate choppy global waters, explains Enge Wang

We live in a period of unprecedented opportunity and daunting challenges. On the one hand, the rapid advancement of science and technology is improving people's lives thanks to better health-care, living conditions and communications. On the other hand, humanity still shivers in the shadow of war and atrocity: the threat of nuclear and other weapons of mass destruction, disastrous environmental deterioration and clashes of nation and civilisation remain clear and present dangers. We are still not free from hatred, greed, selfishness, tribalism and territorialism.

In the midst of this drama, China, a country with a quarter of the world's population, has re-emerged as a swiftly growing world power in economic strength and political influence. Undoubtedly, whether it can further its progress to become a more modern and open society and a responsible member of the global village is of paramount importance to the world.

More urgently than ever, the world yearns for leaders who possess a deep understanding of the humanities, culture and science, who have far-sighted vision, who are equipped with the capability for rational, critical and creative thinking, and who possess the characteristics of perseverance and determination. Peking University, the oldest and most influential institution of higher learning in China, bears an unyielding responsibility to cultivate such leaders.

Peking has had an unparalleled impact on China's social development. It was established as the pre-eminent national institution for higher learning in the late Qing Dynasty and was transformed into a research university in the early 1900s.

Since its infancy, the institution has been the point of origin for every major social movement in contemporary Chinese history, as well as a bridge between East and West. Yan Fu, an



early Peking president, paved the way to the Chinese Enlightenment by translating and introducing monumental works such as Thomas Huxley's *Evolution and Ethics*, Adam Smith's *The Wealth of Nations* and John Stuart Mill's *On Liberty*. Cai Yuanpei, the founding father of modern education in China, ignited the spiritual torch of unrestricted intellectual exploration, which became the motto and a quintessential belief that fundamentally defined Peking. He and his colleagues

including Hu Shi, Chen Duxiu and Lu Xun led the May Fourth Movement that ended the feudal system in the early 20th century. For the first time in Chinese history, these visionary leaders explicitly advocated "Democracy and Science" – often referred to as "Mr D and Mr S" – which became beacons for the whole society.

Peking presidents Cai Yuanpei, Hu Shi and Fu Sinian also established the Chinese academies of sciences, social sciences and the humanities, and

forcefully drove academic research in the country. Meanwhile, Peking's academics and associates, including Mao Zedong, were the main proponents of Marxism and socialism in China and established the Chinese Communist Party. For more than three decades, the university has been on the front line of guiding the country's rapid development, formulating the "open-door" policy and producing the conceptual framework for reform – plus a large number of the leaders who have implemented it.

At Peking, education is a matter of inspiration, as the pedagogy required to cultivate leaders is qualitatively different from that needed to produce technical experts. In an increasingly utilitarian world, the university continues to uphold the ideal that personal success be married with higher callings.

It has never been the institution's goal to produce technically well-trained but intellectually underdeveloped individuals. While we ensure that students receive concrete training in each discipline, we passionately encourage them to develop rational, critical and creative thinking informed by a sense of history and a philosophical perspective.

The university believes that a liberal arts education offers tremendous lifelong value to students. Peking is one of a handful of all-round liberal arts universities in China, with leading scholars across the humanities, social sciences, science and technology on the payroll. This broad-based provision plays a central role in our cultivation of future leaders.

Just as the arts, humanities and social sciences are indispensable foundations for every student's growth, a general and integrated scientific education is also essential for today's citizens – and even more so for future leaders. The knowledge and capabilities of modern science and technology enable artists, writers, lawyers and social scientists to be more creative and imaginative, infused with deeper understanding of human nature, often even in quantitative ways. Therefore, while we emphasise our humanities and social sciences foundation, we equally insist that students have a solid background in science: mathematics,



physics, chemistry, life sciences and information science are introduced to all.

Insisting on excellence in studies with such breadth and depth poses a serious practical question: how can we avoid student burnout and leave them with enough time and energy to explore freely, think deeply and even daydream? Like our colleagues all over the world, we are constantly attempting to address this question. We do not pretend to have solved it, but we are exploring several options.

First, the curriculum needs to be updated and reorganised in a more efficient way. Second, the sciences, humanities and social sciences should be taught in an integrated manner that unites all parts into meaningful wholes. Third, technologies such as the internet, interactive learning software and online courses need to be utilised to enhance teaching-learning proficiency.

Fortunately, our faculty and students are fully convinced of the value of all-round education. With this unshakeable conceptual consensus in place, practical experiments with new pedagogy can thrive.

One of the experiments relates to globalisation. For China to be integrated into the global village and for the world to know and accept the country as a fully respected member, mutual communication is a must.

We prepare our students for a globalised world by promoting a sound understanding of mankind's treasured heritage. More than 60 per cent of our students and 90 per cent of our faculty have international experience via academic exchanges.

In the reverse direction, in 2012 there were more than 1,000 international faculty members teaching on campus for various periods, 2,000 visits from international experts, 2,479 degree-pursuing foreign students and 6,000 visits by non-degree students. Currently, an ambitious plan is being charted to make Peking a hub for eminent international scholars, investigators, developers and students. In light of this, we are establishing full English course tracks in different disciplines for foreign students as well as their domestic peers.

Education is open-ended and needs constant innovation and experimentation. We recognise the necessity of a trial-and-error approach and so have established Yuanpei College, named after Peking's most influential leader in education, Cai Yuanpei. The college serves as a testing ground for all kinds of reform and innovation in higher education, including changes in admissions processes and the creation of new and integrated curricula in science, liberal arts and the social sciences.

This is a critical time for China and the world. As the pre-eminent and most influential educational institution in the country for more than a century, Peking will continue to be a leader in Chinese higher education and will constantly improve itself to become a truly world-class university.

The global play goes on: together we will contribute a verse.

Enge Wang is professor of physics and president of Peking University.

Social path throu

University research is an astonishing force for good in the world, argues Leszek Borysiewicz

Universities the world over have done much in recent decades to dispel the lazy but stubborn notion that our institutions are solely places of esoteric and abstract thought, conducted by unworldly dons, in gowns, over port, in towers made (as surely we would all recognise from our university estates!) of ivory. If ever there were a time that could justifiably contrast universities with "the real world", it is long past. My University of Cambridge colleague Stefan Collini deploys an enjoyable satire that reveals the "real world" to be a construct invented by "cloistered businessmen in their ivory factories": they should, he recommends, get out more.

Serving society – my preferred term for what used to be called the real world – is the conscious passion of everyone who works in a modern university. We do it, of course, in uncountably different ways: the institutions that appear in this publication are glori-

ously diverse and (let us not forget) are not trying to do the same thing in the same way. Still, the drive to serve society is a characteristic we proudly share.

Our impact on the world derives both from education and research. Cambridge is among those institutions that – though unwavering in providing an excellent and distinctive education – measure success increasingly through the impact of research.

Research is often presented as a series of irreconcilable contradictions: bottom-up versus top-down; fundamental versus applied; lone scholar versus multidisciplinary team. Each has its advantages and disadvantages, and it has long seemed to me that the essence of university leadership is identifying and tending the fertile middle ground, resisting the many invitations to choose a favoured mode.

Funders of research, of course, have their own favoured modes, and such tendencies therefore matter to us. I observe trends away from shorter grants towards longer; away from individual applicants towards collaborative work; away from single-discipline focus towards multidisciplinary breadth; and away from blue-skies, investigator-led speculative approaches towards centrally defined themes to which investigators are expected to respond. None of these trends in isolation is wrong or damaging – but the net effect of their combination may be to damage the generation of genuinely new knowledge.

Tackling global grand challenges is laudable and is indeed among our core duties, but doing so relies on what Donald Stokes, sometime dean of the Woodrow Wilson



gh Pasteur's quadrant



SCIENCE PHOTO LIBRARY

School at Princeton University, has called “basic research with considerations of use”: the sort of work Louis Pasteur did, which Stokes contrasts both with the pure curiosity of Niels Bohr and – critically – with the applied focus of Thomas Edison. The combined trends in research funding appear greatly to favour our Edisons at the expense of our Pasteurs. As with all else, moderation is key: it is valuable for some of our researchers to be looking at this year’s grand challenges, as long as they are not all doing so.

To secure the advantages of these trends and minimise the drawbacks, universities shift strategy. For example,

at Cambridge we are actively diversifying our research income: industrial partnerships, the European Union and international sources all count for much more than in the past. But where the money comes from is secondary to what it enables us to do.

Our universities set out to change the world through our research, and do so time after time. Researchers from this small city have created and now sustain Europe’s biggest high-tech hub (there are more than 1,500 technology-based companies in the Cambridge region, employing 54,000 people and generating a turnover of more than £12 billion).

They are equally impactful overseas. Two recent examples: academics from Cambridge are joining with colleagues from Makerere University in Uganda and the University of Ghana to create a programme to strengthen Africa’s capacity for sustainable research and mentoring by cultivating the talented individuals who will work at this long-term goal. Cambridge archaeologists, too, are collaborating with Turkish, German and American colleagues in the excavations – hurried, before the construction of a dam is completed and the valley flooded – of Ziyaret Tepe, a site in Turkey that may provide evidence of the world’s first multiethnic empire.

It is just the sort of challenge at which universities excel.

All universities have such stories to tell, varying according to our missions, but each telling of our profound consequence for society. We must always exercise vigilance and seek to understand how the means we devise affect these ends – but my firm conviction is that university research is an astonishing force for good in the world, and that we can be proud – beyond measure – of our part in it.

Sir Leszek Borysiewicz is vice-chancellor of the University of Cambridge.

Peer-to-peer culture

Research-led teaching on campus is the best option for academics and students, argues [Ian Young](#)

There is much rhetoric about the link between research and education. Indeed, it is often claimed that it is essential for universities to encompass both. The evidence, however, does not support this position: there are many fine teaching-only institutions that offer students an excellent education.

Nevertheless, I believe that there are significant advantages to the research-led approach. For this to be true, research must be at the core of the university mission. This is clearly the case at the Australian National University, where our strategic plan states that education will be research-led.

We satisfy a number of conditions to make the plan a reality. For starters, teaching staff must be active researchers of international quality. This ensures that the curriculum sits at the cutting edge of knowledge. It also means that students are imbued with a culture of discovery. In today's technological world, information is everywhere: the real challenge is to determine its quality. The educated person of the future will be the one who can critique this information and research its validity. Hence, research skills will become synonymous with education.

The fact that an institution produces world-class research does not mean that its pedagogy will be research-led: students need an environment in which they can interact with top researchers. In this regard, the size of the institution is critical. I do not believe one can have such interactions in a university of, say, 40,000 or 50,000 students. Although the institution may produce quality research, is it really possible in such an educational environment



for students to develop real research skills or experience research culture at first hand? Again, this is something that ANU sees as an important element of the educational experience. Although growing the size of the institution may have financial advantages, it would change fundamentally the way students interact with their teachers. To develop research attributes, it helps enormously to be immersed in research activity.

As any good educator knows, only a small fraction of learning occurs in the class or laboratory. Peer interaction is critical. The best universities attract the best students, and in many respects the teachers just need to steer them in the right direction and ask them challenging questions. Great students learn much by interacting and debating with their peers. In a similar manner, great researchers develop by peer inter-

action. Therefore, the environment in which students learn is critical.

Here, a residential experience is hard to beat. Total immersion 24/7 in an environment that challenges gifted students enhances learning and development. This is one of ANU's great strengths. Whereas almost all Australian universities are "commuter" campuses, our institution has a very large percentage of students resident on campus. As a result, education does not stop at the end of a lecture or tutorial: it continues through debate with one's peers or in the many public evening lectures delivered by noted visitors.

So research has many positive effects on education, but I believe the reverse is also true. As a researcher myself, I know that my most productive years came when I was actively teaching, too. The need to continually test yourself against gifted students keeps you on your toes. You sharpen your ability to explain complex concepts and to better understand the issues yourself. This clarity of thought enhances both the quality and the impact of research.

If one looks at the institutions that regularly top the world rankings, they all have the attributes described above: high-quality research, a relatively small population of outstanding students and a residential experience. The environment created in such universities enhances research and education. Although other types of institution can do well in the rankings, the evidence suggests that they do not make it to the very top.

Ian Young is vice-chancellor and president of the Australian National University.

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Leading any 21st-century university is a challenging task, but undertaking this responsibility in the developing world is even more onerous, since the contextual challenges tend to be more acute and the systemic environment more complex.

Structural poverty and inequality in these societies seep across institutional boundaries and force the university's executive to confront local problems, such as students who cannot afford to eat and who battle to find accommodation. Systemic disparities in education mean that limited state budgets are directed at primary and secondary education, with the result that underfunding in higher education is perpetuated. And in a world where science and higher education have no national boundaries, addressing these challenges while still pursuing globally competitive university education and research requires hard trade-offs that are not simply managerial and strategic but also ethical and moral.

As a relevant and responsive institution, the University of Witwatersrand, at the heart of the South African and African economy, needs to confront these challenges. In one sense, it is blessed. Like its host country, Wits reflects multiple social realities within its precincts. It has world-class infrastructure and a balance sheet that most African universities can only aspire to. Yet this budget, while large by African standards, is minuscule compared with those of its international peers and seen against its own ambitions. Moreover, although the university can boast world-class scientists, research and teaching, it still has to manage basic problems of student homelessness and even starvation. In addition, given that South Africa is still in its developmental phase, Wits constantly has to balance the imperatives of building a globally competitive university with demands to be nationally responsive. Thankfully, these need not be mutually exclusive goals.

There are some, of course, who hold that to be world class requires eschewing the national and imitating the foreign. Wits, by contrast, holds as a principle that it is precisely in responding to the national context that an institution can become globally competitive. It is the responsiveness to one's contextual specificities that enhances a university's ability to make unique

Mutually inclusive goals

A commitment to meeting national needs can lead a charge to world-class status, argues Adam Habib



contributions to the global corpus of knowledge. To use two Wits examples: deep-level mining engineering and palaeontology – both globally competitive institutional strengths that required, and were enabled by, a responsiveness to national challenges and endowments.

A second principle informing our approach is a more globally recognised and common one: world-class universities are built by great academics who are given financial resources and an enabling environment within which to operate. Both goals – national responsiveness and global competitiveness – will define our agenda in the years ahead.

National responsiveness is reflected in our commitment to diversity and racial integration. Wits is currently the

most demographically representative of South Africa's research-intensive universities. Yet we are also mindful of the importance of retaining our cosmopolitan character both in national and racial terms, and doing so without explicit or implicit racial quotas.

National responsiveness is also reflected in our rejuvenated attempt to address progression and completion rates. South Africa's statistics in this regard are shocking. The vast majority of students – well in excess of 80 per cent – do not complete their degrees within the minimum time. About 50 per cent leave university without a qualification.

In an attempt to address this national challenge, Wits will revitalise its academic support programmes through the establishment of a teaching and learning academy, where strug-

gling students will be identified early in their studies and provided with tutorial and other support interventions. In addition, we are reorganising our Centre for Learning, Teaching and Development to further professionalise our pedagogy.

Finally, in an effort to address inequality – the Achilles heel of South African society – Wits will introduce a new scholarship programme. Currently we have a vice-chancellor's merit scholarship targeted at the top students in the country. Now we will introduce the vice-chancellor's equality scholarship, to be targeted at the top students (merit is still retained) in the most marginalised and depressed schools in the country. We will also continue with our Targeting Talent programme, where we bring on to campus pupils from rural schools and provide deep-immersion preparation for university life. These initiatives are meant to strengthen hope and aspiration in a section of society where these qualities are sometimes fragile.

Yet global competitiveness is also integral to our agenda. In the coming months, Wits will recruit 30 scholars defined by South Africa's National Research Foundation as being at the cutting edge of their disciplines globally. A number of multidisciplinary research institutes have already been or are in the process of being launched. Research productivity is to be revitalised with the introduction of incentives and penalties.

Wits will also increase its existing cohort of postdoctoral fellows by 100, and fund its postgraduate scholarships to the tune of R300 million (£19 million) over five years so as to significantly increase its postgraduate footprint.

By the end of the decade, Wits should be much more research-productive and postgraduate-oriented.

This set of measures is intended to create a more globally competitive yet nationally relevant and responsive Wits – mutually compatible goals. Not only will these measures be important for South Africa achieving its developmental potential, but they will also enable Wits to take its place as an equal partner at the heart of Africa in a global commons of 21st-century universities.

Adam Habib is vice-chancellor and principal of the University of Witwatersrand.

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Highly accomplished outcasts

Simon Pratt takes a closer look at the elite graduate schools and specialists excluded from the World University Rankings

University rankings can have far-reaching influence, and a change in ranking position can have a big impact. However, some institutions are excluded from the rankings completely not because of their performance, but rather because of their unusual characteristics.

In the Times Higher Education World University Rankings, institutions are excluded for three reasons: low research output; a single or very narrow disciplinary focus; or their status as graduate-only schools.

Robust comparisons of the performance of these institutions against the carefully balanced range of 13 indicators in the THE World University Rankings are challenging, and any attempt to include them in the overall tables would be imperfect and unrepresentative of their real performance.

It is a difficult decision to exclude universities from the rankings, and it is unfortunate that some excellent institutions have to miss out. However, it is impossible to assign these atypical institutions with positions that are meaningful or fair.

Thomson Reuters has worked with THE to help develop specific criteria for excluding universities from the overall rankings based on their data. By developing exclusion criteria, we have made the tables more robust and decreased year-on-year fluctuations in position.

But Thomson Reuters has a comprehensive dataset of hundreds of institutions well beyond the top 400 featured in the rankings, and we can use this data to look in depth at the strengths and weaknesses of all institutions, not just those featured in the tables.

On these pages we highlight the strengths of some world-class institutions that do not feature in the world top 400 list.

Simon Pratt is product manager for institutional research at Thomson Reuters.



Graduate schools, of course, do not teach undergraduates, so they tend to have different demographics from typical universities. It is important to realise that although we can create indicators and indicator groups for such institutions, the data must be put in context and should be used only to make comparisons between similar institutions: holding them up against World University Rankings runners and riders is not recommended.

Among the graduate schools, we can subdivide the institutions into three types: those that concentrate on the social sciences; medical schools; and those institutions that focus on research and research-based teaching. The charts (right) show those institutions that can be considered “world class” – that is, those performing at a similar level to the ones that feature in the World University Rankings.

In general, graduate schools tend towards a narrow disciplinary focus and are relatively small. Logically, a narrow disciplinary focus and small size would limit the number of interactions an institution can have with the global academic community. This suggests that such institutions would be unlikely to excel in the Thomson Reuters academic reputation survey used to help create the *THE* World University Rankings.

However, despite these disadvantages, the University of California, San Francisco does very well in the survey and was ranked among the top 50 in the world in 2012. Additionally, the London School of Hygiene and Tropical Medicine, London Business School, Israel’s Weizmann Institute of Science and global business school Insead more than hold their own in reputation terms against their larger peers.

Most of these institutions also score well for research paper citations. They excel at their chosen missions, thus ensuring that they are considered among the best in the world by their peers.

In creating the graduate school table, the indicator used in the overall World University Rankings that looks at the ratio of undergraduate to doctoral degrees has been removed, with the weighting of other indicators in the “Teaching: the learning environment” group increased to compensate. However, all the other weightings are identical to the World University Rankings methodology. It is worth noting that these indicators may benefit the graduate schools (for example, their staff-to-student ratios are relatively high).

Specialist universities

Highly specialist institutions are excluded from the World University Rankings because of their very narrow

disciplinary focus and/or low total research output, which makes citation analysis difficult. But when the institutions have sufficient output in one of the six specialist areas measured by the *THE* subject rankings, they are included accordingly. The profiles bring the institutions together in one place so that we can see how they compare.

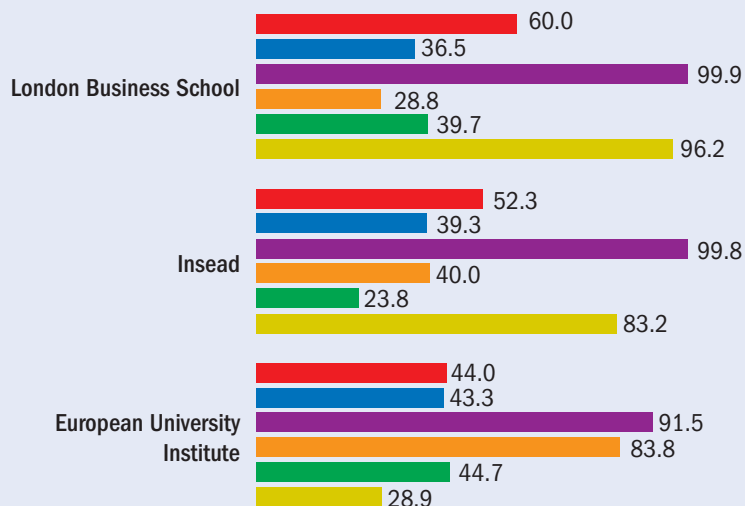
When preparing the data for the subject tables, we employ methodological variations to make the rankings more robust. The different subjects have their own weighting schemata that are designed to highlight the specific characteristics of each subject area. For example, citation analysis is typically not considered to be as robust an indicator in the arts and humanities as it is in the hard sciences, and therefore its weighting is decreased (see page 52).

Additionally, each individual indicator is calculated within the context of the subject area. The indicator scores represent where that institution falls compared with everyone else in the same subject discipline, and because the characteristics for the subjects are different, the scores will vary.

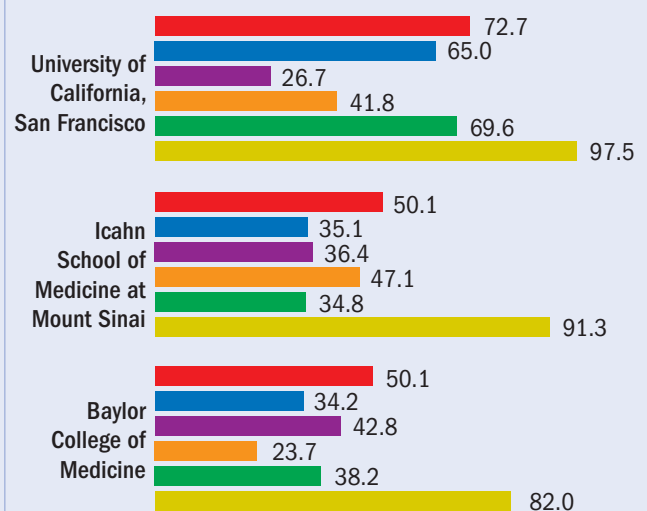
For these reasons, the data in the table are a fair representation of the performance within each subject area, but not a representation of how that institution might fare in the overall rankings.

UNSUNG HEROES: TOP SCHOOLS OUTSIDE THE RANKINGS

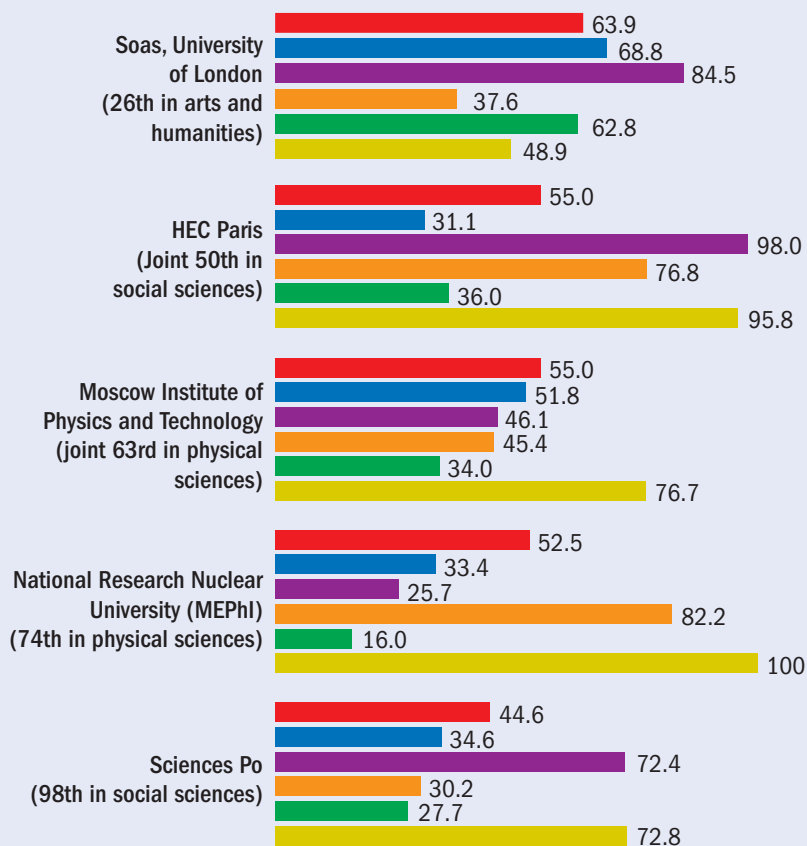
Social science-focused graduate schools



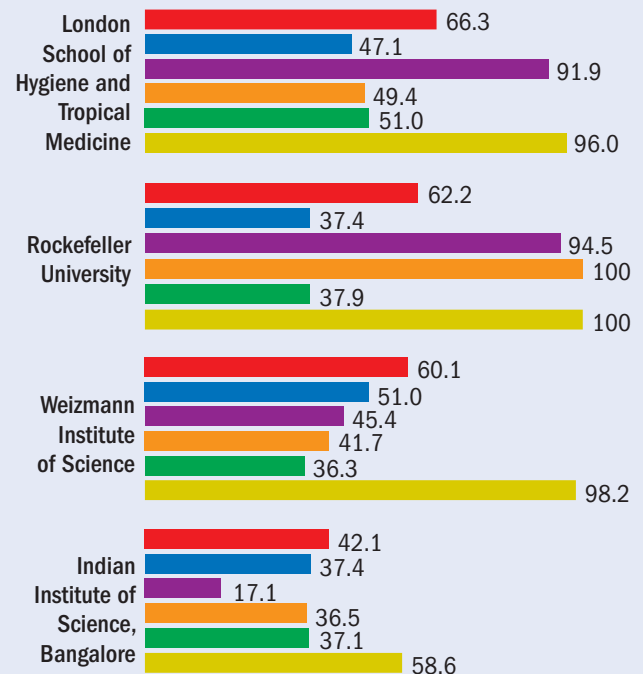
Graduate-only medical schools



Specialist institutions



Research-focused graduate schools



KEY

- Overall score
- Teaching
- International outlook
- Industry income
- Research
- Citations

All data taken from Thomson Reuters Global Institutional Profiles



Squadron supreme

Our subject tables are dominated by the same elite players jockeying for position, explains Phil Baty

The California Institute of Technology may have held on to the top spot in the rankings for the third consecutive year, but in our subject tables it is not so simple.

In something of a merry-go-round, the same players dominate the top of the tables just as they did last year, but in a different order. In three, the summit has a new occupant: Harvard University has taken the crown for life sciences from the Massachusetts Institute of Technology; MIT, meanwhile, has displaced Caltech as the world's best engineering and technology institution; while Stanford University has stolen MIT's number one spot in social sciences.

Stanford has held on to its top rank in the arts and humanities, making it the only institution to lead more than one subject table. Caltech has maintained its number one position in the physical sciences, while the University of Oxford still leads clinical, pre-clinical and health.

On the following pages we reveal the top 50 in each of the six subject fields. To see the top 100 figures, visit www.timeshighereducation.co.uk/world-university-rankings

DIFFERENT WEIGHTS AND MEASURES

The subject tables employ the same range of 13 performance indicators used in the overall World University Rankings (page 30), brought together with scores provided under five categories:

- **Teaching:** the learning environment
- **Research:** volume, income and reputation
- **Citations:** research influence
- **International outlook:** staff, students and research
- **Industry income:** innovation.

Here, the overall methodology is carefully recalibrated for each subject, with the weightings changed to best suit the individual fields. In particular, those given to the research indicators have been altered to fit more closely the research culture in each subject, reflecting different publication habits: in the arts and humanities, for instance, where the range of outputs extends well beyond peer-reviewed journals, we give less weight to paper citations.

Accordingly, the weight given to "citations: research influence" is halved from 30 per cent in the overall rankings to just 15 per cent for the arts and humanities.

More weight is given to other research indicators, including the academic reputation survey.

For social sciences, where there is also less faith in the strength of citations alone as an indicator of research excellence, the measure's weighting is reduced to 25 per cent.

By the same token, in those subjects where the vast majority of research outputs come through journal articles and where there are high levels of confidence in the strength of citations data, we have increased the weighting given to the research influence (up to 35 per cent for the physical and life sciences and for the clinical, pre-clinical and health tables).

A breakdown of the methodology for each subject is provided at the foot of the tables.

CRITERIA

No institution can be included in the overall World University Rankings unless it has published a minimum of 200 research papers a year over the five years we examine.

But for the six subject tables, the threshold drops to 100 papers a year for subjects that generate a high volume of publications and 50 a year in subjects such as social sciences where the volume tends to be lower.

Although we apply some editorial discretion, we generally expect an institution to have at least 10 per cent of its staff working in the relevant discipline in order to include it in the subject table.

The majority of institutions in Thomson Reuters' Global Institutional Profiles database, which fuels the rankings, provide detailed subject-level information. In rare cases where such data are not supplied, institutions are either excluded or public sources are used to inform estimates.

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The Massachusetts Institute of Technology can boast that it has helped to bring into the world (in no particular order): the fax machine; the transistor radio; Bose speakers; the global positioning system; the spreadsheet; Technicolor; air conditioning; Hewlett-Packard; the microchip; open courseware; and (of course) the World Wide Web.

So it is little surprise to learn that the 150-year-old US institution is the world number one when it comes to engineering and technology.

The establishment of MIT was promoted in the 1850s by geologist William Barton Rogers, who would become its first president upon its foundation in 1861, days before the outbreak of the American Civil War. Amid the US' rapid industrialisation, Rogers had conceived the notion of a "polytechnic" institute focusing on technical and scientific education to support the nation's development, in stark contrast with the Latin- and Greek-dominated university curricula of the day.

Indeed, MIT can lay claim to pioneering entire fields of engineering in the US, including electrical engineering (1882), aeronautical engineering (1914) and nuclear physics (1935), and it boasts nearly 80 Nobel laureates.

Notable alumni include physicist Richard Feynman, former United Nations secretary general Kofi Annan and Apollo 11 astronaut Buzz Aldrin, the second man to walk on the Moon.



ENGINEERING AND TECHNOLOGY

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	3	Massachusetts Institute of Technology	US	94.0	90.0	98.9	99.2	76.4	93.1
2	=5	Stanford University	US	90.4	95.5	98.6	-	73.6	91.9
3	4	University of California, Berkeley	US	88.5	96.5	98.0	79.1	56.3	90.6
4	1	California Institute of Technology	US	95.1	82.8	98.6	-	75.2	90.5
5	2	Princeton University	US	88.3	89.5	98.8	100.0	52.5	89.5
6	=5	University of Cambridge	UK	92.8	90.3	85.2	81.6	84.1	88.8
7	11	University of Oxford	UK	94.0	91.3	81.6	63.1	85.4	87.6
8	8	ETH Zürich-Swiss Federal Institute of Technology Zürich	Switzerland	88.8	92.0	79.3	82.0	89.8	86.9
9	10	Imperial College London	UK	90.6	87.6	80.9	74.1	87.8	86.0
10	7	University of California, Los Angeles	US	81.8	86.6	97.2	-	63.7	84.9
11	9	Georgia Institute of Technology	US	81.6	88.3	82.5	76.4	64.5	82.3
12	15	Carnegie Mellon University	US	88.3	90.7	72.3	73.4	53.8	81.3
13	12	National University of Singapore	Singapore	81.8	84.4	70.3	79.2	89.2	79.8
14	13	University of Texas at Austin	US	74.0	81.9	88.9	90.4	49.2	79.4
15	14	École Polytechnique Fédérale de Lausanne	Switzerland	75.3	76.8	87.1	42.4	96.2	78.9
16	19	University of Michigan	US	82.1	85.7	75.1	61.7	61.2	78.7
17	18	Cornell University	US	77.5	83.1	86.6	44.6	40.7	77.3
18	20	University of Illinois at Urbana-Champaign	US	80.2	83.5	70.3	-	49.7	74.3
19	16	Northwestern University	US	63.6	67.0	98.3	54.4	42.0	72.1
20	17	University of California, Santa Barbara	US	51.8	59.7	98.4	100.0	73.3	71.0
21	23	Hong Kong University of Science and Technology	Hong Kong	65.8	70.3	74.6	66.4	77.6	70.5
22	22	University of Toronto	Canada	65.1	70.8	83.9	34.5	53.7	69.6
23	32	Delft University of Technology	Netherlands	79.0	80.5	48.9	-	66.2	68.9
24	31	Tsinghua University	China	83.2	79.0	47.0	99.9	29.0	68.8
25	44	Korea Advanced Institute of Science and Technology	South Korea	78.0	73.5	53.9	100.0	31.2	67.6
26	-	Technische Universität München	Germany	66.4	59.5	80.1	46.4	56.9	66.4
27	28	University of Tokyo	Japan	78.9	74.9	52.4	-	44.1	66.3
28	41	University of Wisconsin-Madison	US	63.3	66.4	76.0	54.7	44.6	65.9
29	=36	Seoul National University	South Korea	72.9	73.7	49.8	81.5	23.4	63.5
30	21	Columbia University	US	55.4	53.0	87.8	-	53.2	63.4
31	34	University of Washington	US	49.3	57.9	88.4	-	57.1	63.1
32	25	University of Melbourne	Australia	49.3	50.1	84.3	68.9	86.2	62.9
33	=26	Nanyang Technological University	Singapore	49.3	58.1	65.4	100.0	93.0	62.2
=34	-	KTH Royal Institute of Technology	Sweden	61.3	56.9	58.2	99.9	76.2	62.1
=34	-	Technical University of Denmark	Denmark	54.6	45.3	81.5	91.5	68.7	62.1
36	40	Katholieke Universiteit Leuven	Belgium	49.6	52.9	78.3	99.6	59.3	61.7
37	33	University of Manchester	UK	61.4	51.9	67.9	50.1	77.6	61.0
38	45	University of Minnesota	US	61.3	57.2	70.3	-	43.2	60.4
=39	47	Kyoto University	Japan	63.5	67.4	51.0	79.0	40.5	60.3
=39	-	RWTH Aachen University	Germany	60.2	59.0	58.8	95.5	48.1	60.3
41	24	Pohang University of Science and Technology	South Korea	53.1	47.6	82.1	100.0	30.2	60.0
42	43	University of Hong Kong	Hong Kong	54.2	55.4	70.9	32.1	79.5	59.9
=43	38	University of Queensland	Australia	41.5	48.9	79.9	98.1	77.0	59.8
=43	=36	University of California, San Diego	US	46.7	50.5	90.5	-	45.8	59.8
45	48	University of California, Davis	US	46.2	49.3	81.8	71.1	66.0	59.7
46	30	Rice University	US	46.2	37.0	100.0	50.7	61.6	59.6
47	-	Peking University	China	54.3	50.9	70.9	100.0	40.2	59.1
48	39	University of British Columbia	Canada	52.7	64.3	59.0	42.8	67.9	58.6
49	-	Monash University	Australia	45.2	45.7	73.9	81.8	84.6	58.1
=50	42	Purdue University	US	66.3	62.5	49.6	-	40.5	57.6
=50	46	University of Sydney	Australia	43.7	43.4	75.7	74.6	92.7	57.6

Methodology

Teaching – the learning environment: 30 per cent; Research – volume, income and reputation: 30 per cent; Citations – research influence: 27.5 per cent; International outlook – staff, students and research: 7.5 per cent; Industry income – innovation – staff and students: 5 per cent

POSTECH, a Trailblazer

When POSTECH was established in 1986, they said a dangerous attempt. Now, the fearless start is astonishing Korea and the world.

POSTECH, the first research university in Korea, aims to be a **great university** preparing the solution for grand challenges faced by nation and human kind, achieving excellence in education & research.

- No.1 University in THE 100 Under 50,2012-2013
- “With an annual spending per student, POSTECH compares favorably with IvyLeague universities in the U.S”
 - “The Road to Academic Excellence” World Bank,2011
- A 2012 Thomson Reuters Top Global Innovator

Big Bang theory and practical application

Scholars in the Division of Physics, Mathematics and Astronomy (PMA) at the California Institute of Technology have never been afraid to tackle the big existential questions: How did the universe begin? What is it made of? How do galaxies, stars and planets form?

Caltech has come further than most in providing the answers: since *Times Higher Education's* world number one institution for the physical sciences was founded in 1891, it has developed world-leading telescopes, explained the solar system's structure, identified the chemical elements inside stars and been involved in striving towards a "theory of everything".

Caltech professors and alumni have won 32 Nobel prizes, 14 to the PMA alone (indeed, Linus Pauling is the only person to be awarded two solo Nobels). In 2004, H. David Politzer shared the Nobel Prize in Physics for work he began as a graduate student on how the elementary particles known as quarks bind together to form the protons and neutrons of atomic nuclei.

"PMA researchers explore the universe from today back to the Big Bang, and from the scale of the cosmos to the scale of atoms and electrons... The division pursues a vision of this magnitude by attracting outstanding people, creating conditions that facilitate discovery, and encouraging high-risk, high-reward work focused on fundamental challenges," the institution says.

Teamwork and collaboration is key: PMA scientists work closely with Nasa's Jet Propulsion Laboratory, a division of Caltech and the US' leading centre for the robotic exploration of the solar system. To infinity and beyond!

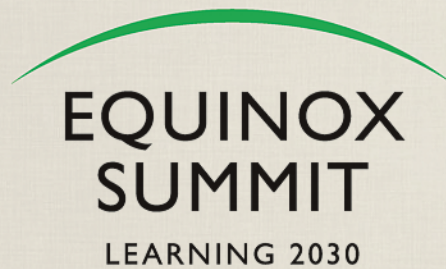


PHYSICAL SCIENCES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	1	California Institute of Technology	US	96.7	83.6	96.3	-	85.2	92.0
=2	7	Massachusetts Institute of Technology	US	87.9	92.5	96.5	71.8	77.9	91.0
=2	3	Princeton University	US	87.4	94.2	97.9	83.2	63.4	91.0
4	5	Harvard University	US	86.4	93.1	98.1	46.0	71.7	90.2
=5	2	University of California, Berkeley	US	82.3	94.6	97.6	100.0	60.8	89.9
=5	4	Stanford University	US	86.4	89.5	98.7	-	74.3	89.9
7	6	University of Cambridge	UK	85.9	91.3	91.9	63.8	83.4	88.8
8	10	University of Oxford	UK	84.0	90.9	88.2	71.7	86.6	87.3
9	9	University of California, Los Angeles	US	76.4	87.6	96.0	-	67.9	85.1
10	8	University of Chicago	US	76.8	79.7	99.5	-	71.6	84.9
11	13	Yale University	US	79.1	82.1	94.1	38.0	71.7	83.6
12	11	ETH Zürich-Swiss Federal Institute of Technology Zürich	Switzerland	82.2	90.9	76.4	69.7	94.4	83.2
13	17	Imperial College London	UK	78.6	86.9	81.9	70.7	87.7	82.5
14	16	Columbia University	US	76.0	68.4	97.6	-	70.6	81.0
15	12	Cornell University	US	76.2	80.5	93.8	35.8	51.9	80.7
16	25	University of Tokyo	Japan	82.4	75.2	70.9	-	50.7	73.5
17	27	University of Toronto	Canada	60.9	64.1	89.5	33.1	68.9	71.7
18	14	University of Washington	US	49.6	65.9	97.9	-	57.7	71.5
19	19	Ludwig-Maximilians-Universität München	Germany	58.4	64.7	91.8	40.7	57.8	71.3
20	15	University of California, Santa Barbara	US	46.5	63.2	98.6	84.3	57.1	71.1
21	18	University of Texas at Austin	US	50.8	65.4	93.3	98.5	53.3	71.0
22	20	University of Michigan	US	57.4	61.5	87.7	45.9	73.3	70.0
23	23	École Polytechnique Fédérale de Lausanne	Switzerland	54.8	53.3	90.3	37.5	94.8	69.4
24	26	University of Melbourne	Australia	55.3	55.4	87.1	89.4	77.4	68.9
25	29	Université Pierre et Marie Curie	France	63.7	60.4	77.7	-	67.5	67.6
26	35	University of British Columbia	Canada	59.0	51.4	85.3	42.1	75.5	67.0
=27	21	Northwestern University	US	44.4	53.7	99.0	48.6	50.3	66.6
=27	38	University of Wisconsin-Madison	US	57.6	60.0	83.9	36.4	52.9	66.6
=29	28	Australian National University	Australia	55.5	72.1	65.0	85.8	77.5	65.8
=29	44	École Normale Supérieure	France	60.5	59.0	74.8	-	70.8	65.8
31	34	Georg-August-Universität Göttingen	Germany	47.7	44.1	99.8	46.7	55.2	65.5
32	=45	Peking University	China	68.1	65.5	66.6	100.0	36.8	65.3
33	24	University of Illinois at Urbana-Champaign	US	51.3	61.3	83.9	-	48.3	65.0
34	33	Rice University	US	43.8	40.3	99.7	36.8	77.1	64.7
35	43	Brown University	US	48.5	40.5	99.6	-	53.5	64.6
36	=39	Kyoto University	Japan	72.5	76.6	52.2	84.6	38.2	64.3
37	31	University of Edinburgh	UK	44.3	40.1	87.8	64.4	80.6	61.6
=38	22	École Polytechnique	France	62.5	38.5	77.7	-	67.4	61.5
=38	-	Pennsylvania State University	US	58.7	48.7	76.3	-	52.4	61.5
40	50	Carnegie Mellon University	US	34.9	44.4	97.9	38.4	58.9	61.4
41	=39	National University of Singapore	Singapore	56.9	56.4	63.6	50.0	87.0	61.2
42	-	Technische Universität München	Germany	58.6	57.2	66.6	42.4	63.1	61.0
43	=39	Universität Heidelberg	Germany	56.4	44.8	77.6	40.3	59.6	60.5
44	30	University of Colorado Boulder	US	34.3	46.6	94.3	-	48.6	59.9
=45	=48	Boston University	US	36.1	40.4	94.5	34.0	61.4	59.6
=45	-	University of California, San Diego	US	43.6	44.5	88.5	-	44.3	59.6
47	47	Georgia Institute of Technology	US	38.7	42.6	87.2	57.2	67.7	59.4
48	-	Stockholm University	Sweden	39.2	32.6	94.2	38.0	58.7	58.1
49	-	University of Minnesota	US	41.2	44.4	86.3	-	43.7	58.0
50	-	University of Manchester	UK	42.3	41.4	80.7	44.6	73.8	57.9

Methodology

Teaching – the learning environment: 27.5 per cent
 Research – volume, income and reputation: 27.5 per cent
 Citations – research influence: 35 per cent
 International outlook – staff, students and research: 7.5 per cent
 Industry income – innovation – staff and students: 2.5 per cent



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Rapid shift from test tube to clinic

Harvard University's world-leading life sciences research received a resounding vote of confidence this year when a foundation headed by Harvard Business School alumnus Len Blavatnik handed over \$50 million (£32 million) to help turn the institution's discoveries into real-world products and applications.

Harvard's Biomedical Accelerator Fund was established in 2007 with \$5 million from Blavatnik to help move the university's ideas from the laboratory to the marketplace. Such was its success that the philanthropist billionaire increased his contribution tenfold earlier this year to create the Blavatnik Biomedical Accelerator.

"By partnering with Harvard's world-class biomedical research division, I am delighted to help accelerate the development of new therapies," he said. His gift has also laid the foundations for future success by creating a programme of life sciences entrepreneurship fellowships at the business school.

Thanks to accelerator support, Harvard stem-cell technology offering fresh avenues of treatment for cancer, Alzheimer's and Parkinson's disease has been licensed to Boston's Proteostasis Therapeutics.

The fund is building on solid ground: the city of Boston has been the largest recipient of research money from the US' National Institutes of Health for 18 consecutive years, with Harvard in the vanguard of attainment.



LIFE SCIENCES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	3	Harvard University	US	90.0	93.0	98.5	51.2	71.1	91.4
2	1	Massachusetts Institute of Technology	US	90.0	91.5	100.0	39.9	68.3	91.0
3	4	University of Oxford	UK	91.4	92.1	90.9	67.3	85.3	90.3
4	2	University of Cambridge	UK	92.9	89.6	92.9	42.8	85.7	90.2
5	5	Stanford University	US	88.8	92.3	96.6	-	55.6	89.0
6	6	University of California, Berkeley	US	87.6	91.5	95.4	37.7	45.8	87.0
7	-	California Institute of Technology	US	84.1	74.3	98.9	-	70.5	85.4
8	8	Princeton University	US	84.3	79.6	96.3	78.3	55.1	84.9
9	9	Yale University	US	79.6	90.7	89.5	42.3	65.7	84.2
=10	10	Imperial College London	UK	86.5	85.3	80.3	40.2	92.2	83.3
=10	7	Johns Hopkins University	US	80.1	81.9	91.2	-	70.8	83.3
12	15	University of California, Los Angeles	US	77.0	86.0	90.4	-	40.0	80.4
13	14	Columbia University	US	79.3	68.8	91.9	-	63.1	79.5
14	13	Cornell University	US	79.2	88.0	82.1	38.5	39.5	78.7
15	16	ETH Zürich-Swiss Federal Institute of Technology Zürich	Switzerland	75.2	77.8	77.3	56.9	94.5	77.7
16	11	Duke University	US	72.2	69.4	94.1	-	54.6	77.5
17	17	University of California, San Diego	US	72.2	65.9	94.4	-	61.0	77.3
18	25	University of California, Davis	US	79.6	87.7	70.5	57.5	56.3	76.3
19	19	University College London	UK	73.6	71.3	77.6	38.7	89.3	74.7
20	12	University of Chicago	US	63.5	70.7	91.2	-	56.6	74.5
21	=22	University of Edinburgh	UK	70.5	71.8	81.5	36.6	75.6	74.3
22	=22	Wageningen University and Research Center	Netherlands	72.0	77.1	74.0	-	78.3	74.1
23	20	University of British Columbia	Canada	70.6	71.5	79.9	35.0	71.1	73.3
24	30	University of Wisconsin-Madison	US	72.0	74.9	78.9	67.6	40.6	72.7
25	24	University of Washington	US	63.3	64.5	89.5	-	37.7	70.3
26	26	University of Toronto	Canada	62.5	69.2	80.6	45.3	54.6	69.7
27	29	University of Tokyo	Japan	80.2	75.6	63.4	-	43.4	69.6
28	27	University of Melbourne	Australia	64.7	66.6	71.4	64.9	80.8	68.8
29	28	McGill University	Canada	65.0	67.3	71.5	-	76.9	68.5
30	31	University of Queensland	Australia	58.4	67.9	74.6	46.2	79.4	68.0
31	33	National University of Singapore	Singapore	66.2	70.3	59.4	84.4	94.3	67.5
32	32	Kyoto University	Japan	70.9	75.7	62.3	73.9	38.9	66.9
33	18	University of Michigan	US	45.5	64.7	87.2	62.0	58.5	66.8
34	21	University of Pennsylvania	US	58.5	48.4	89.5	-	47.6	65.7
35	37	Ludwig-Maximilians-Universität München	Germany	61.0	61.5	75.4	37.9	53.6	65.1
36	36	Australian National University	Australia	54.1	62.8	70.5	78.8	75.1	64.4
37	46	King's College London	UK	47.8	50.2	85.0	42.0	81.7	63.9
38	34	Uppsala University	Sweden	62.8	55.8	67.5	29.8	62.5	61.7
39	-	University of Minnesota	US	56.1	61.2	72.9	-	32.0	61.1
40	48	Ghent University	Belgium	54.1	48.6	71.9	99.5	64.5	60.7
41	-	Osaka University	Japan	58.4	63.5	65.6	85.3	25.4	60.5
42	42	University of Copenhagen	Denmark	48.1	53.4	71.0	-	73.6	59.6
43	35	University of North Carolina at Chapel Hill	US	42.8	40.8	89.5	36.6	48.2	58.8
=44	-	University of Glasgow	UK	45.1	47.9	75.5	32.1	74.9	58.4
=44	-	New York University	US	45.1	38.8	88.2	-	44.0	58.4
46	-	Michigan State University	US	58.6	55.6	62.6	-	47.5	58.2
47	-	University of Helsinki	Finland	46.8	53.4	71.0	31.1	58.7	57.6
=48	-	Georg-August-Universität Göttingen	Germany	55.8	54.1	60.8	48.6	55.4	56.9
=48	=44	Université de Lausanne	Switzerland	37.4	30.1	84.5	66.1	95.2	56.9
=48	39	University of California, Santa Barbara	US	28.6	42.7	90.0	99.8	43.7	56.9

Methodology

Teaching - the learning environment: 27.5 per cent
 Research - volume, income and reputation: 27.5 per cent
 Citations - research influence: 35 per cent
 International outlook - staff, students and research: 7.5 per cent
 Industry income - innovation - staff and students: 2.5 per cent

A WORLD TOP 100 UNIVERSITY: INSPIRING MINDS SINCE 1963

Ranked number 1 in the UK and 7th in the world (THE 100 Under 50)



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- **A beautiful location** – York is one of the safest cities in the UK and one of Europe's top tourist destinations

Strong narratives and tales of hope

As Barack Obama awarded the National Humanities Medal at a White House ceremony in 2012 to Ramón Saldivar, professor of English and comparative literature at Stanford University, in recognition of his cultural explorations of the US-Mexico border, the president said: “You’ve helped guide our growth as a people.”

Picking up on the theme, Saldivar commented at the time that such awards highlight “the importance of the arts and humane disciplines for maintaining vibrant intellectual and creative activity at the core of US civic life”.

It is this commitment to the arts and humanities that has helped Stanford retain the number one spot in the field for the third consecutive year.

Stanford currently boasts three National Humanities Medal recipients and five Pulitzer prizewinners, the latest of whom was Adam Johnson, associate professor of English, who won the 2013 award for fiction for his novel *The Orphan Master’s Son*, which is set in North Korea.

He said: “I couldn’t have written the book without Stanford. From all parts of the university, the narrative is valued. I know it’s a place where people are excited about stories.”

And that excitement is set to be sustained well into the future. Through the Arts 2016 drive, the humanities have become a core beneficiary of the Stanford Challenge, the unprecedented \$6.2 billion (£4 billion) fundraising campaign that closed in 2011. This is providing cash to enhance programmes, buildings and facilities, and to “integrate the arts throughout university life”, Stanford said.



ARTS AND HUMANITIES

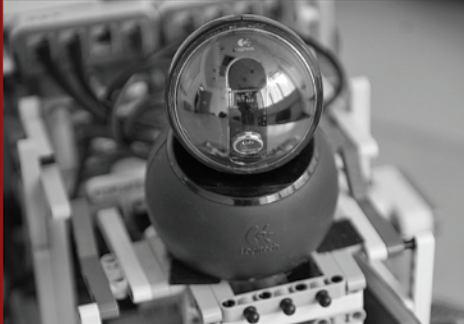
Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	1	Stanford University	US	92.5	92.7	71.5	-	70.4	87.1
2	=3	Harvard University	US	93.6	93.2	68.1	39.4	64.9	86.1
3	6	University of Oxford	UK	90.2	95.3	55.7	42.4	72.6	84.4
4	8	University of Cambridge	UK	90.7	95.6	51.7	52.3	65.9	83.9
5	=3	University of Chicago	US	86.1	93.7	57.6	-	60.2	82.2
6	7	University of California, Berkeley	US	86.9	95.4	57.9	39.5	44.2	81.4
=7	9	Princeton University	US	89.9	90.8	57.9	39.2	49.9	81.2
=7	15	Yale University	US	87.6	92.7	54.0	40.5	60.6	81.2
9	16	University of California, Los Angeles	US	85.9	90.2	56.1	-	42.9	78.8
10	2	Columbia University	US	83.5	82.8	63.4	-	54.6	77.4
11	10	University College London	UK	81.0	86.0	49.1	41.8	82.0	77.2
12	17	University of Toronto	Canada	77.0	85.9	60.2	37.6	46.3	74.5
13	=23	University of Melbourne	Australia	80.3	76.8	43.8	54.2	79.6	72.8
14	18	University of Michigan	US	72.2	83.4	65.6	41.2	45.2	72.6
15	13	Australian National University	Australia	62.2	86.7	71.1	47.9	64.1	72.5
16	11	University of Edinburgh	UK	74.5	79.4	54.0	38.9	71.6	72.1
17	12	New York University	US	75.8	80.6	53.4	-	46.1	71.3
18	5	University of Pennsylvania	US	75.9	72.2	65.4	-	55.6	71.1
19	28	King's College London	UK	73.4	72.5	50.3	37.6	82.7	69.4
20	21	University of Sydney	Australia	73.0	71.6	53.7	48.6	76.6	69.3
21	32	Ludwig-Maximilians-Universität München	Germany	73.6	75.1	47.2	56.7	65.8	69.2
22	25	Freie Universität Berlin	Germany	71.4	80.4	37.8	39.1	57.5	67.9
23	19	Cornell University	US	73.0	72.5	61.7	37.6	40.8	67.8
24	14	Duke University	US	68.7	65.5	68.4	-	57.1	66.6
25	38	Universität Heidelberg	Germany	70.4	69.4	40.1	38.2	62.0	64.0
26	-	Soas, University of London	UK	68.8	62.8	48.9	37.6	84.5	63.9
27	20	Rutgers, the State University of New Jersey	US	60.7	69.5	62.8	-	38.3	62.3
28	26	Leiden University	Netherlands	67.3	65.5	43.2	41.1	57.0	61.6
29	30	Humboldt-Universität zu Berlin	Germany	66.6	64.8	39.7	-	54.3	60.6
30	48	Durham University	UK	64.3	58.1	49.7	45.8	60.9	59.1
31	=23	McGill University	Canada	62.0	54.7	53.8	-	75.1	58.6
32	22	University of Texas at Austin	US	59.6	57.3	70.7	40.2	38.8	58.4
33	27	University of Wisconsin-Madison	US	53.3	64.7	64.5	42.2	41.2	58.1
34	40	University of British Columbia	Canada	54.0	59.8	55.8	38.9	62.0	56.7
35	=46	University of Vienna	Austria	60.2	53.3	45.2	-	69.6	55.7
36	37	Katholieke Universiteit Leuven	Belgium	53.6	57.7	48.3	96.3	54.1	55.5
37	34	University of St Andrews	UK	60.1	50.7	42.3	38.1	79.4	54.8
38	39	University of Manchester	UK	49.6	54.5	64.2	37.9	67.0	54.6
39	33	University of North Carolina at Chapel Hill	US	55.0	56.8	54.0	39.5	35.2	53.6
40	29	University of Hong Kong	Hong Kong	52.9	47.7	51.6	53.3	89.6	53.5
=41	-	University of Amsterdam	Netherlands	47.7	61.8	48.8	44.7	52.0	53.4
=41	41	University of Notre Dame	US	57.2	56.6	51.0	-	28.6	53.4
43	31	Brown University	US	59.0	55.2	42.3	-	38.3	53.1
44	=43	University of Warwick	UK	49.9	51.9	55.1	37.6	64.8	52.3
=45	=46	Lancaster University	UK	51.8	42.7	71.4	37.8	64.7	51.9
=45	-	Monash University	Australia	56.7	47.6	38.1	60.9	74.0	51.9
47	45	University of Pittsburgh	US	46.9	57.3	61.4	38.2	32.7	51.7
48	-	University of Southern California	US	56.0	48.1	58.2	-	36.3	51.6
49	=43	National University of Singapore	Singapore	49.7	48.6	46.0	43.5	86.9	51.4
50	-	University of Birmingham	UK	50.7	47.6	57.6	50.0	57.0	51.1

Methodology

Teaching – the learning environment: 37.5 per cent
 Research – volume, income and reputation: 37.5 per cent
 Citations – research influence: 15 per cent
 International outlook – staff, students and research: 7.5 per cent
 Industry income – innovation – staff and students: 2.5 per cent



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Suitable treatment for global suffering

Scholars at the University of Oxford led the development of penicillin. They laid the groundwork for immunisation by discovering how antibodies and the immune system work. They also provided incontrovertible evidence for the link between smoking and cancer.

Oxford's medical sciences academics advanced X-ray crystallography. They also proved the life-saving efficacy of today's most effective malaria treatment, artemisinin, work that changed the World Health Organisation's recommendations for tackling the global killer.

With a deep network of clinical research units in Asia and Africa, the university's medical researchers are leading the fight against the world's most pressing health challenges, including the resurgence of tuberculosis, mutating influenza viruses and HIV/Aids.

With such a record, it is clear that Oxford deserves the number one position in the clinical, pre-clinical and health table, an honour it retains for the third year running.

The university's Medical Sciences Division is one of the largest biomedical research centres in Europe, with more than 2,500 researchers and technicians and over 2,800 students. Oxford has one of the largest clinical trial portfolios in the UK and specialises in taking discoveries from the lab bench to the clinic. Its partnerships with local NHS trusts enable patients to benefit from close links between medical research and delivery.

And the university's focus on world-class research has in no way distracted it from teaching: results of the 2013 National Student Survey showed Oxford Medical School to be the best in the UK for medicine.



CLINICAL, PRE-CLINICAL AND HEALTH

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	1	University of Oxford	UK	86.8	92.0	97.6	100.0	81.3	91.9
2	2	Harvard University	US	90.9	94.1	96.9	37.8	71.0	91.1
3	3	University of Cambridge	UK	78.7	91.6	93.4	48.7	80.1	86.8
4	5	Imperial College London	UK	82.6	86.9	92.7	55.4	83.8	86.7
5	8	Stanford University	US	84.4	91.0	93.9	-	52.7	86.2
6	15	Columbia University	US	89.5	80.2	92.0	-	67.7	86.0
7	4	Johns Hopkins University	US	83.9	84.0	93.9	-	63.2	84.9
8	13	University of California, Los Angeles	US	88.6	88.4	89.8	-	43.9	84.6
9	6	University College London	UK	80.1	86.6	87.3	57.1	84.2	84.2
10	7	Duke University	US	85.7	74.6	95.1	-	64.9	84.1
11	11	Yale University	US	83.6	87.4	87.2	43.0	59.3	83.1
12	10	University of Washington	US	79.7	88.4	91.6	-	40.8	82.6
13	20	King's College London	UK	76.3	78.5	89.9	39.4	84.2	81.3
14	23	Karolinska Institute	Sweden	81.6	90.8	76.8	56.7	69.8	81.0
15	22	University of Toronto	Canada	86.8	88.1	77.4	64.9	53.8	80.8
16	=16	University of Melbourne	Australia	77.8	81.7	82.5	75.0	78.7	80.5
17	=16	University of Pennsylvania	US	79.0	72.5	93.5	-	54.6	80.1
18	18	McGill University	Canada	78.6	82.1	81.1	-	66.1	79.1
19	21	University of Michigan	US	72.9	81.7	88.8	48.3	44.9	78.2
20	12	Washington University in St Louis	US	71.3	71.8	95.3	-	41.1	77.0
21	9	University of California, Berkeley	US	63.6	73.4	97.4	35.5	46.6	76.1
=22	29	Boston University	US	69.2	63.6	95.8	36.4	50.4	74.8
=22	19	University of North Carolina at Chapel Hill	US	70.6	70.5	91.2	43.1	40.7	74.8
24	24	University of Pittsburgh	US	69.2	73.8	90.3	40.7	35.3	74.6
25	25	University of Sydney	Australia	65.9	77.5	77.2	69.4	83.3	74.5
26	14	McMaster University	Canada	61.6	64.0	92.8	88.9	67.5	74.3
27	28	University of Edinburgh	UK	61.8	60.9	89.4	50.1	65.9	71.2
28	30	Cornell University	US	64.3	66.2	87.8	41.8	41.3	70.7
29	31	University of Chicago	US	61.2	61.6	90.8	-	50.9	70.6
30	27	University of British Columbia	Canada	64.6	66.1	81.8	53.5	57.3	70.2
31	=32	University of Tokyo	Japan	74.4	68.6	72.5	-	47.5	69.8
32	=32	Emory University	US	65.8	52.0	92.0	45.6	45.3	69.1
33	26	University of California, San Diego	US	55.2	54.3	95.3	-	54.1	68.9
34	35	University of Queensland	Australia	57.5	66.6	72.0	62.8	73.7	66.4
35	=45	University of Minnesota	US	63.8	60.2	82.1	-	31.9	66.3
36	38	Northwestern University	US	55.5	56.1	88.3	91.0	29.8	66.1
37	48	Erasmus University Rotterdam	Netherlands	55.8	54.2	84.2	-	64.6	65.8
=38	=45	Katholieke Universiteit Leuven	Belgium	46.2	57.3	85.6	99.9	62.5	65.6
=38	34	Monash University	Australia	61.3	59.2	72.0	84.4	69.2	65.6
40	-	Universität Heidelberg	Germany	60.2	59.7	76.8	44.4	59.3	65.4
41	=50	University of Manchester	UK	54.3	61.5	78.1	45.4	65.6	65.2
42	37	National University of Singapore	Singapore	57.3	57.0	69.5	49.1	92.5	63.9
43	49	Maastricht University	Netherlands	49.2	57.3	75.1	99.2	74.3	63.6
44	40	Kyoto University	Japan	61.4	66.7	67.8	67.8	38.5	63.5
45	-	Seoul National University	South Korea	73.0	77.0	51.4	93.1	23.7	63.4
46	42	Ludwig-Maximilians-Universität München	Germany	58.2	55.1	75.1	43.3	61.5	63.1
47	41	Vanderbilt University	US	52.3	48.2	90.8	49.7	27.4	62.7
48	36	University of Hong Kong	Hong Kong	49.0	57.2	69.3	60.2	86.5	61.5
49	=43	Tufts University	US	43.9	41.2	93.9	44.5	53.9	61.4
50	39	University of Massachusetts	US	60.7	54.5	74.2	38.7	27.6	60.7

Methodology

Teaching – the learning environment: 27.5 per cent
 Research – volume, income and reputation: 27.5 per cent
 Citations – research influence: 35 per cent
 International outlook – staff, students and research: 7.5 per cent
 Industry income – innovation – staff and students: 2.5 per cent

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Since 1905, the National University of Singapore (NUS) has blazed a path towards excellence. Today, NUS is a leading global university located in the heart of Asia, consistently ranked among the world's top universities.

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Rich crop of Nobel laurels at 'The Farm'

Based at the heart of California's Silicon Valley, Stanford University has an outstanding record in science and technology research, but its multidisciplinary approach has also enabled it to take the social sciences crown.

Almost 20 per cent of undergraduates at the university earn social sciences degrees, and the institution known as "The Farm" has nine living Nobel laureates in economics alone – most recently Alvin Roth, who shared the 2012 prize for his work on market design.

Roth, described by Stanford provost John Etchemendy at the time of his victory as a "heck of a nice human being" as well as a top academic, is a pioneer in the field of game theory and experimental economics.

Four Stanford laureates are affiliated with the world-renowned Hoover Institution. Founded in 1919 by Herbert Hoover, a Stanford alumnus who went on to become the 31st US president, the institution began as an archive for First World War documents but evolved into the US' first thinktank. It later took its place among the world's largest libraries on political, economic and social change.

In a statement to the board of trustees in 1959, Hoover said that the institution was "not, and must not be, a mere library. But with these purposes as its goal, the institution itself must constantly and dynamically point the road to peace, to personal freedom, and to the safeguards of the American system."



SOCIAL SCIENCES

Rank 2013-14	Rank 2012-13	Institution	Country	Teaching	Research	Citations	Industry income	International outlook	Overall score
1	3	Stanford University	US	96.1	96.8	97.9	-	60.6	93.6
=2	1	Massachusetts Institute of Technology	US	92.5	95.3	98.3	100.0	71.9	93.5
=2	=4	University of Oxford	UK	95.0	98.7	86.5	91.5	88.8	93.5
4	=4	Harvard University	US	93.2	99.0	96.3	39.6	58.2	91.9
5	=6	Princeton University	US	89.6	97.6	99.0	86.9	44.3	91.1
6	2	University of Chicago	US	90.4	94.5	96.3	-	55.7	90.2
7	=6	Yale University	US	96.0	92.9	94.4	30.0	55.8	90.0
8	10	University of Cambridge	UK	92.4	91.6	82.3	35.5	83.2	87.5
9	14	University of California, Berkeley	US	86.0	95.0	91.1	-	50.4	86.9
10	=12	University of California, Los Angeles	US	90.7	94.4	89.8	-	38.3	86.8
11	8	University of Pennsylvania	US	91.4	80.6	92.6	-	70.6	86.6
12	=12	University of Michigan	US	80.8	97.3	90.7	91.6	42.8	86.1
13	18	London School of Economics and Political Science	UK	87.5	86.7	82.3	70.8	87.4	85.5
14	17	New York University	US	89.3	79.0	90.7	-	63.9	84.2
15	9	Columbia University	US	89.6	80.3	85.8	-	59.5	82.9
16	11	University College London	UK	77.9	85.1	86.0	47.4	86.1	82.1
17	15	Northwestern University	US	81.2	84.0	95.9	31.8	35.6	81.1
18	21	University of Wisconsin-Madison	US	79.0	81.4	89.4	73.8	51.7	80.2
19	22	University of Toronto	Canada	75.0	79.8	76.9	29.7	55.8	74.5
20	19	University of British Columbia	Canada	69.3	74.0	85.7	31.1	65.9	73.7
21	23	University of Melbourne	Australia	70.2	83.4	62.3	53.0	79.2	72.8
22	16	Duke University	US	68.8	58.5	91.8	-	55.9	70.2
23	28	University of Texas at Austin	US	69.5	68.1	82.2	63.2	37.7	69.7
24	24	Cornell University	US	70.3	69.7	82.2	29.0	32.3	69.2
25	=45	King's College London	UK	57.3	64.3	85.4	74.4	79.7	68.7
26	20	Australian National University	Australia	61.6	75.1	68.3	43.1	70.1	67.8
27	=25	McGill University	Canada	62.5	63.6	74.6	-	74.7	66.7
28	27	University of Washington	US	55.8	64.3	87.9	-	35.9	64.8
=29	=34	Ohio State University	US	53.2	67.6	84.1	30.8	44.6	64.4
=29	39	National University of Singapore	Singapore	65.6	69.1	52.5	43.4	85.7	64.4
31	=25	University of North Carolina at Chapel Hill	US	57.3	65.1	84.7	34.8	33.6	64.3
32	29	University of Minnesota	US	57.6	62.4	79.5	-	29.7	62.2
33	36	University of Sydney	Australia	54.4	61.6	67.3	55.0	81.1	62.0
34	-	University of Amsterdam	Netherlands	50.6	68.0	69.3	62.8	54.0	61.5
35	=34	University of Illinois at Urbana-Champaign	US	56.0	65.9	70.0	-	35.2	60.7
36	40	University of Queensland	Australia	49.6	65.9	60.3	39.2	80.9	59.7
37	41	Peking University	China	52.2	46.1	74.0	100.0	86.8	59.5
38	-	University of Southern California	US	59.1	54.9	73.4	-	36.1	59.4
39	30	University of Hong Kong	Hong Kong	44.7	61.0	64.7	94.8	84.9	59.3
40	33	University of New South Wales	Australia	48.4	59.8	63.3	65.3	79.2	58.6
41	38	Carnegie Mellon University	US	39.8	54.0	90.2	36.8	56.5	58.2
42	48	University of Warwick	UK	53.1	53.8	64.7	32.7	79.3	57.7
43	-	Indiana University	US	57.9	50.9	70.9	-	42.3	57.5
44	44	University of Edinburgh	UK	52.6	56.9	61.9	38.2	69.9	57.3
45	=50	Hong Kong University of Science and Technology	Hong Kong	39.2	48.9	80.7	40.8	96.0	57.0
46	42	University of Manchester	UK	54.1	48.8	65.6	38.6	77.4	56.6
47	-	Erasmus University Rotterdam	Netherlands	40.6	54.5	76.3	-	68.7	56.1
48	43	Washington University in St Louis	US	44.6	48.5	88.4	-	32.0	55.6
49	47	Michigan State University	US	51.5	47.9	75.8	-	38.8	55.3
=50	37	Pennsylvania State University	US	53.9	49.8	70.9	-	34.0	55.0
=50	-	HEC Paris	France	31.1	36.0	95.8	76.8	98.0	55.0

Methodology

Teaching – the learning environment: 32.5 per cent
 Research – volume, income and reputation: 32.5 per cent
 Citations – research influence: 25 per cent

International outlook – staff, students and research: 7.5 per cent
 Industry income – innovation – staff and students: 2.5 per cent



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*Times Higher Education World University Rankings 2010

New world pecking order

Ben Wildavsky charts the rise and rise of university rankings, domestic and international

Why do we rank schools and universities – or sports teams and washing machines, for that matter? To answer this question, we need to go far, far back in human history – to the caveman era. That, at least, is the theory of one prominent ranker, veteran journalist Jay Mathews of *The Washington Post*. He is the father of the *Newsweek* and *Washington Post* rankings of US high schools, and has also written extensively on the university-industrial complex. By Mathews' reckoning, we must never forget that *Homo sapiens* is a tribal primate. We love pecking orders that help us understand who is up, who is down and where we stand ourselves. This is why, somewhere in the mists of time, Rankings Man was born.

To be sure, it took many millennia before our innate rankings impulse could be applied to universities. It wasn't until 1874 that hereditarian Francis Galton published *English Men of Science: Their Nature and Nurture*, which tallied the universities attended by more than 100 scientists – notable among them Oxbridge and a variety of “Scotch, Irish or London universities”.

Galton didn't attempt an actual ordinal listing by quality, however. That first happened in 1910, when American James McKeen Cattell used a complex methodology (sound familiar?) to create a table showing how 20 US universities stacked up against one another based on the number of accomplished scientists they employed.

In the decades that followed, the sifting and sorting of universities continued in various forms. But the Big Bang of today's rankings occurred in 1983 with the advent of *US News & World Report's* “America's Best Colleges” issue. Initially a straightforward reputational poll of college presidents, the magazine's rankings soon became more data-driven, incor-



porating information on graduation rates, student qualifications and more. The *US News* guide became hugely popular, much to the consternation of college presidents and other critics.

Perhaps inevitably, many other publications capitalised on the rankings mania, including *Forbes*, *The Wall Street Journal* and *Business Week*. Niche marketing emerged, too, as with *Sierra* magazine's “greenest” colleges list and *Princeton Review's* annual “top party schools” roster.

Meanwhile, the rest of the world took notice. National-level league tables emerged in more than 40 countries, from Argentina to Pakistan. It was only a matter of time before the growing global university marketplace, featuring increasingly mobile students, professors and branches, would lead to global academic rankings.

In 2003, Shanghai Jiao Tong University created the first closely watched worldwide league table,

focused heavily on scientific research. The following year, the *Times Higher Education Supplement* launched its own rankings, featuring a much heavier reliance on reputational surveys. Before long, students and policymakers seeking cross-border college comparisons could consult everything from Spain's Ranking Web of Universities – Webometrics to the Russian Global Universities Ranking.

Humans' deep-seated preoccupation with pecking orders is, of course, no guarantee of agreement on how we decide who should be top dog. Like their US antecedents, global rankings efforts have been lambasted for everything from an excessive focus on research to an undue emphasis on reputation, from poor data quality to elitism. Some critics have even protested their low standing by creating counter-rankings: for example, the French engineering

school Mines ParisTech undertook one such revisionist exercise, leading to the classic 2008 headline “French Do Well in French World Rankings”.


Today, one of the biggest league table controversies involves the European Union's U-Multirank project. This new kid on the block aims to usher in an era of build-your-own rankings. It will collect data from a broad spectrum of universities in five areas – research, teaching and learning, international orientation, knowledge transfer and regional engagement – to capture the many dimensions that make them tick. Institutions will be sorted only by category, not overall; users can construct their own league tables based on the characteristics they care about most.

It is an ambitious and, in many ways, laudable endeavour. But critics, including the League of European Research Universities, say that it depends too much on data that are not reliable and cannot be properly compared across nations. Many believe the detractors are in fact worried that U-Multirank's holistic approach will give a leg up to continental European universities and challenge the incumbent world-leading research institutions in the UK and the US.

So what does all this tell us about the past, present and future of university league tables? We know that rankings have become considerably more sophisticated over the past century since the days of counting scientists. We know that they continue to be vulnerable to a range of criticisms, some legitimate. At the same time, this truism is true: rankings are not going away. In fact, they are spreading: even Barack Obama has proposed rating US universities according to access, affordability and student outcomes.

Slowly but surely, rankings are getting better. After all, today's competition is not just for dominance between universities, but between the league tables themselves. Surely, Rankings Man would approve.

Ben Wildavsky is director of higher education studies at the Rockefeller Institute of Government, State University of New York, and policy professor at SUNY-Albany.



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