International University Rankings

University Chancellors Council Oct 2017
Why do rankings matter?

• Used extensively by international students in their decision making
• Some funding agencies and international governments have written them into their policies
• Most publicly reported indicator of University reputation and quality
• Partnerships
• Mostly are an indicator of performance to some degree
Research from QS on how Students use their rankings

GLOBAL, NATIONAL OR REGIONAL RANKINGS?

- Global: 77%
- National: 19%
- Regional: 4%

SUBJECT-SPECIFIC OR OVERALL?

- Overall: 22%
- Subject-specific: 78%
Why shouldn’t they matter?

• All have methodology flaws
• All potentially encourage perversive incentives
• Very poorly understood by those who use them (government, media, prospective students etc)
A new ranking every second day?

• Over 20 world rankings
• Numerous country specific rankings
• Ever increasing spinoff rankings – sub rankings by subject, university age and region
The three main rankings

Academic Ranking of World Universities (ARWU) - Shanghai Jiao Tong

Times Higher Education World University Rankings (THE) - Thomson Reuters

Quacquarelli Symonds (QS) World University Rankings
## Consistency across rankings

<table>
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<tr>
<th>OVERLAP</th>
<th>THE</th>
<th>WEBO</th>
<th>QS</th>
<th>ARWU</th>
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<tr>
<td>COMMON IN <strong>TOP 200</strong></td>
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<td>ARWU</td>
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<td>WEBO</td>
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<td>44/100</td>
<td>104/200</td>
<td>165/300</td>
<td>235/400</td>
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Academic Ranking of World Universities (ARWU)
Shanghai Jiao Tong

http://www.shanghairanking.com/
About

- Established 2003 to determine where Chinese universities sat in the world
- Was well received in EU and US, leading to it being considered more academically rigorous
- World Ranking, Broad Field Ranking, Subject Rankings, Specialised Rankings
- Minimises optimisation by using public data
In order to be ranked

- 1300 universities ranked, 800 published
- To be ranked, the university must have either
  - Nobel Laureates
  - Fields Medallists
  - Highly Cited Researchers
  - Papers published in Nature or Science
  - Significant amount of papers indexed by Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI)
Indicators and Weights
Definitions - ARWU

Quality of Education - Alumni
The total number of the alumni of an institution winning Nobel Prizes and Fields Medals. Alumni are defined as those who obtain bachelor's, master's or doctoral degrees from the institution. Different weights are set according to the periods of obtaining degrees. The weight is 100% for alumni obtaining degrees in 2001-2010, 90% for alumni obtaining degrees in 1991-2000, 80% for alumni obtaining degrees in 1981-1990, and so on, and finally 10% for alumni obtaining degrees in 1911-1920. If a person obtains more than one degrees from an institution, the institution is considered once only.

Quality of Faculty - Award
The total number of the staff of an institution winning Nobel Prizes in Physics, Chemistry, Medicine and Economics and Fields Medal in Mathematics. Staff is defined as those who work at an institution at the time of winning the prize. Different weights are set according to the periods of winning the prizes. The weight is 100% for winners after 2011, 90% for winners in 2001-2010, 80% for winners in 1991-2000, 70% for winners in 1981-1990, and so on, and finally 10% for winners in 1921-1930. If a winner is affiliated with more than one institution, each institution is assigned the reciprocal of the number of institutions. For Nobel prizes, if a prize is shared by more than one person, weights are set for winners according to their proportion of the prize.
Definitions - ARWU

Quality of Faculty – Highly Cited Researchers (HiCi)
The number of Highly Cited Researchers selected by Clarivate Analytics. The Highly Cited Researchers list issued in November 2016 (2016 HCR List as of November 16 2016) was used for the calculation of HiCi indicator in ARWU 2017. Only the primary affiliations of Highly Cited Researchers are considered.

Research Output - Nature & Science (N&S)
The number of papers published in Nature and Science between 2012 and 2016. To distinguish the order of author affiliation, a weight of 100% is assigned for corresponding author affiliation, 50% for first author affiliation (second author affiliation if the first author affiliation is the same as corresponding author affiliation), 25% for the next author affiliation, and 10% for other author affiliations. When there are more than one corresponding author addresses, ARWU consider the first corresponding author address as the corresponding author address and consider other corresponding author addresses as first author address, second author address etc. following the order of the author addresses. Only publications of 'Article' type is considered.
Definitions - ARWU

Research Output – Papers indexed in Science Citation (PUB)
Total number of papers indexed in Science Citation Index-Expanded and Social Science Citation Index in 2016. Only publications of 'Article' type is considered. When calculating the total number of papers of an institution, a special weight of two was introduced for papers indexed in Social Science Citation Index.

Per Capita Performance (PCP)
The weighted scores of the above five indicators divided by the number of full-time equivalent academic staff. If the number of academic staff for institutions of a country cannot be obtained, the weighted scores of the above five indicators is used. For ARWU 2017, the numbers of full-time equivalent academic staff are obtained for institutions in USA, UK, France, Canada, Japan, Italy, China, Australia, Netherlands, Sweden, Switzerland, Belgium, South Korea, Czech, Slovenia, New Zealand etc.
Times Higher Education World University Rankings (THE)
Thomson Reuters

https://www.timeshighereducation.com/world-university-rankings/2018
About

- Established 2004
- World ranking, subject specific rankings, reputation ranking, young university ranking, emerging market ranking, country rankings
- Independently verified by PwC
- Controversial use of surveys
In order to be ranked

• 1000 institutions ranked
• To be ranked
  – The university must teach undergraduates
  – At least 1000 articles published between 2012 and 2016
  – 80% of the activity cannot be in one subject area
Definitions – Times Higher

Teaching (the learning environment): 30%
Reputation survey: 15%
Staff-to-student ratio: 4.5%
Doctorate-to-bachelor’s ratio: 2.25%
Doctorates-awarded- to-academic-staff ratio: 6%
Institutional income: 2.25%

The most recent Academic Reputation Survey (run annually) that underpins this category was carried out in January to March 2017, attracting 10,568 responses. It examined the perceived prestige of institutions in teaching. The responses were statistically representative of the global academy’s geographical and subject mix. The 2017 data are combined with the results of the 2016 survey, giving more than 20,000 responses.

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 is scaled against academic staff numbers and normalised for purchasing-power parity (PPP). It indicates an institution’s general status and gives a broad sense of the infrastructure and facilities available to students and staff.
Definitions - Times Higher

Research (volume, income and reputation): 30%
Reputation survey: 18%
Research income: 6%
Research productivity: 6%

The most prominent indicator in this category looks at a university’s reputation for research excellence among its peers, based on the responses to Times Higher’s annual Academic Reputation Survey.

Research income is scaled against academic staff numbers and adjusted for purchasing-power parity (PPP). 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, their 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.

To measure productivity they count the number of papers published in the academic journals indexed by Elsevier’s Scopus database per scholar, scaled for institutional size and normalised for subject. This gives a sense of the university’s ability to get papers published in quality peer-reviewed journals. This year, Times Higher devised a method to give credit for papers that are published in subjects where a university declares no staff.
Definitions – Times Higher

Citations (research influence): 30%

Times Higher’s research influence indicator looks at universities’ role in spreading new knowledge and ideas. They examine research influence by capturing the number of times a university’s published work is cited by scholars globally. This year, their bibliometric data supplier Elsevier examined almost 62 million citations to more than 12.4 million journal articles, article reviews, conference proceedings and books and book chapters published over five years. The data include the 23,000 academic journals indexed by Elsevier’s Scopus database and all indexed publications between 2012 and 2016. Citations to these publications made in the six years from 2012 to 2017 are also collected.

The citations help to show Times Higher how much each university is contributing to the sum of human knowledge: they tell them 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 their understanding, irrespective of discipline.

The data are 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. Times Higher have blended equal measures of a country-adjusted and non-country-adjusted raw measure of citations scores.

In 2015-16, they excluded papers with more than 1,000 authors because they were having a disproportionate impact on the citation scores of a small number of universities. Since last year, they have designed a method for reincorporating these papers. Working with Elsevier, they have developed a new fractional counting approach that ensures that all universities where academics are authors of these papers will receive at least 5 per cent of the value of the paper, and where those that provide the most contributors to the paper receive a proportionately larger contribution.
Definitions – Times Higher

**International outlook (staff, students, research): 7.5%**
International-to-domestic-student ratio: 2.5%
International-to-domestic-staff ratio: 2.5%
International collaboration: 2.5%
The ability of a university to attract undergraduates, postgraduates and faculty from all over the planet is key to its success on the world stage.

In the third international indicator, they 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.

**Industry income (knowledge transfer): 2.5%**
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 (adjusted for PPP), 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.
Quacquarelli Symonds (QS) World University Rankings

https://www.topuniversities.com qs-world-university-rankings
About

• Established 2004
• 1.1 million people visited the QS website within the first 2 days of the release last year
• World Ranking, University Age, Locality, Subject, Student Cities
• Survey controversial – 70,000+ academic responses, 40,000+ employers
## Indicators

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<th>Indicator</th>
<th>Weight (%)</th>
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<tr>
<td>Academic Reputation from Global Survey</td>
<td>40%</td>
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<tr>
<td>Faculty Student Ratio</td>
<td>20%</td>
</tr>
<tr>
<td>Citations per Faculty from Scopus</td>
<td>20%</td>
</tr>
<tr>
<td>Employer Reputation from Global Survey</td>
<td>10%</td>
</tr>
<tr>
<td>Proportion of International Students</td>
<td>5%</td>
</tr>
<tr>
<td>Proportion of International Faculty</td>
<td>5%</td>
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</table>
2018 Academic Reputation Survey Responses Geographic Distribution
75,015 Responses

The region chart above is not based on location or nationality but on the area(s) of the world the respondent has knowledge or experience of from a research and education perspective. Respondents can identify more than one region, hence the sum of the proportions exceed 100%.
Methodology - QS

Academic reputation (40%)
The highest weighting of any metric is allotted to an institution’s Academic Reputation score. Based on their Academic Survey, it collates the expert opinions of over 70,000 individuals in the higher education space regarding teaching and research quality at the world’s universities. In doing so, it has grown to become the world’s largest survey of academic opinion, and, in terms of size and scope, is an unparalleled means of measuring sentiment in the academic community.

Employer reputation (10%)
Students will continue to perceive a university education as a means by which they can receive valuable preparation for the employment market. It follows that assessing how successful institutions are at providing that preparation is essential for a ranking whose primary audience is the global student community.

QS’ Employer Reputation metric is based on over 30,000 responses to their QS Employer Survey, and asks employers to identify those institutions from which they source the most competent, innovative, effective graduates. The QS Employer Survey is also the world’s largest of its kind.

Previously, international responses were weighted at 70%, with domestic responses contributing 30% of the total score for this metric. This has been changed this year: international and domestic responses will contribute 50% each to an institution’s final score.
Methodology - QS

**Faculty/Student Ratio (20%)**
Teaching quality is typically cited by students as the metric of highest importance to them when comparing institutions using a ranking. It is notoriously difficult to measure, but they have determined that measuring teacher/student ratios is the most effective proxy metric for teaching quality. It assesses the extent to which institutions are able to provide students with meaningful access to lecturers and tutors, and recognizes that a high number of faculty members per student will reduce the teaching burden on each individual academic.

*Faculty/student Ratio* constitutes 20 percent of an institution's final score

**International faculty ratio/International student ratio (5% each)**
A highly international university acquires and confers a number of advantages. It demonstrates an ability to attract faculty and students from across the world, which in turn suggests that it possesses a strong international brand. It implies a highly global outlook: essentially for institutions operating in an internationalised higher education sector. It also provides both students and staff alike with a multinational environment, facilitating exchange of best practices and beliefs. In doing so, it provides students with international sympathies and global awareness: soft skills increasingly valuable to employers. Both of these metrics are worth 5% of the overall total.
Methodology - QS

Citations per faculty (20%)

Teaching is one key pillar of an institution’s mission. Another is research output. QS measure institutional research quality using their *Citations per Faculty* metric. To calculate it, we the total number of citations received by all papers produced by an institution across a five-year period by the number of faculty members at that institution.

To account for the fact that different fields have very different publishing cultures – papers concerning the Life Sciences are responsible nearly half of all research citations as of 2015 – QS normalize citations. This means that a citation received for a paper in Philosophy is measured differently to one received for a paper on Anatomy and Physiology, ensuring that, in evaluating an institution’s true research impact, both citations are given equal weight.

QS have made one alteration to citation counts for this year. Previously, the five-year window for citations has included the year in which that table was published. For example, last year’s release would have taken into account citations received between 2011 and 2016.

However, after consultation with their Advisory Board, QS have altered this window to exclude the year in which the table is published. This accounts for the fact that new research requires time to be effectively disseminated throughout the academic community, and papers published in the same year as the rankings table have typically had little time to gain traction. Therefore, the citations window used for this year’s *citations per faculty* metric have been received between 2011 and 2016, while next year’s *QS World University Rankings* will measure those received between 2012 and 2017.

All citations data is sourced using Elsevier’s *Scopus* database, the world’s largest repository of academic journal data. This year, QS assessed 99 million citations from 10.3 million papers once self-citations were excluded.
Other Rankings of Note

**Leiden**
The Leiden Ranking 2017 includes 903 universities from 54 different countries. These are all universities worldwide that have produced at least 1000 Web of Science indexed publications in the period 2012–2015. Only so-called *core publications* are counted, which are publications in international scientific journals.
http://www.leidenranking.com/

**U- MultiRank**
U-MultiRank is developed and implemented on the initiative of the European Commission. U-MultiRank is a new multidimensional, user-driven approach to international ranking of higher education institutions. It compares the performances of higher education institutions – in short: universities – in the five broad dimensions of university activity: (1) teaching and learning, (2) research, (3) knowledge transfer, (4) international orientation and (5) regional engagement. The U-MultiRank web tool enables comparisons at the level of the university as a whole and at the level of specific fields of study. Based on empirical data U-MultiRank compares institutions with similar institutional profiles (‘like-with-like’) and allows users to develop their own personalised rankings by selecting indicators in terms of their own preferences.
http://www.umultirank.org
Other Rankings

Best Global Universities Rankings (US News)

Best Global Universities rankings encompass the top 1,000 institutions spread across 65 countries. To create the pool of 1,262, U.S. News first included the top 200 universities in the results of Clarivate Analytics' global reputation survey, described further below. Next, U.S. News added institutions that had published the largest number of articles during the most recent five-year period (2010-2014) that was used for the bibliometric data, de-duplicated with the top 200 from the reputation survey. The second step was to calculate the rankings using the 12 indicators and weights that U.S. News chose to measure global research performance.

https://www.usnews.com/education/best-global-universities

Why does this ranking matter:
• 40 Million Page Views per Month
• 7 Million Unique Visitors per Month