

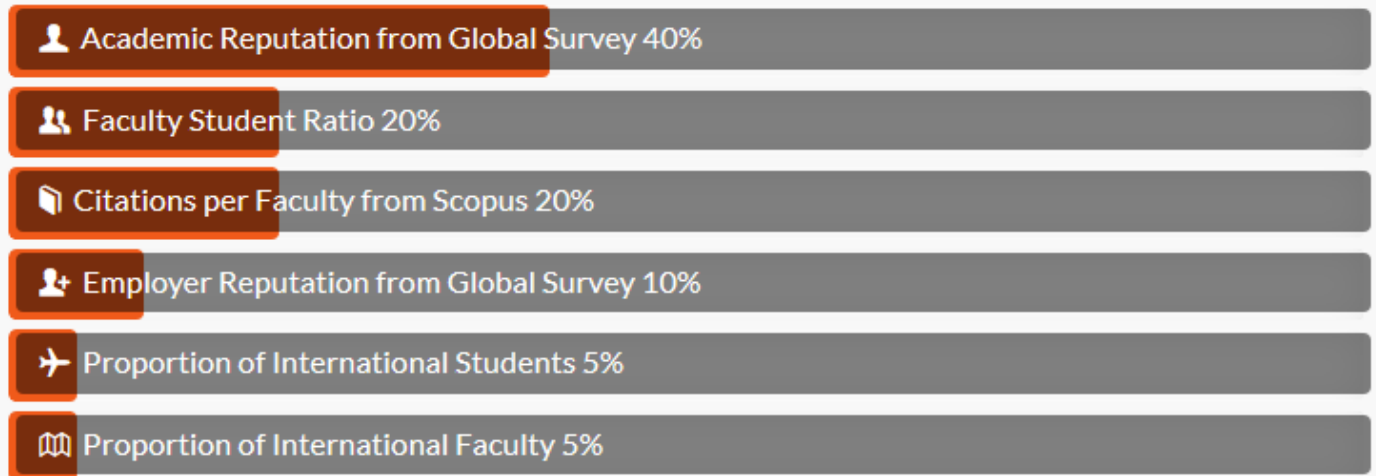


Rankings Methodology - Table of Contents

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Indicators



Methodology of QS World University Rankings

| Indicator | Weighting | Elaboration |
|-----------------------------|-----------|---|
| Academic peer review | 40% | Based on an internal global academic survey |
| Faculty/Student ratio | 20% | A measurement of teaching commitment |
| Citations per faculty | 20% | A measurement of research impact |
| Employer reputation | 10% | Based on a survey on graduate employers |
| International student ratio | 5% | A measurement of the diversity of the student community |
| International staff ratio | 5% | A measurement of the diversity of the academic staff |

Academic reputation (40%)

The highest weighting of any metric is allotted to an institution's *Academic Reputation* score. Based on our *Academic Survey*, it collates the expert opinions of over 94,000 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.

Our *Employer Reputation* metric is based on almost 45,000 responses to our *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.

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 we 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.

Citations per faculty (20%)

Teaching is one key pillar of an institution's mission. Another is research output. We measure institutional research quality using our *Citations per Faculty* metric. To calculate it, we take 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 – we *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.












We use a five-year publication window for papers, so for this edition we looked at papers published from 2013 to 2017. We then take a look at a six-year citation window; reflecting the fact that it takes time for research to be effectively disseminated. In this edition we look for citations from 2013-2018.

All citations data is sourced using Elsevier's *Scopus* database, the world's largest repository of academic journal data. This year, QS assessed 74 million citations from 13.5 million papers once self-citations were excluded.

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.

Indicators

| | |
|---|---|
|  | Academic Reputation from Global Survey 30% |
|  | Employer Reputation from Global Survey 20% |
|  | Faculty Student Ratio 10% |
|  | Citations per Paper from Scopus 10% |
|  | International Research Network Index 10% |
|  | Papers per Faculty from Scopus 5% |
|  | Proportion of staff with PhD 5% |
|  | Proportion of International Students 2.5% |
|  | Proportion of International Faculty 2.5% |
|  | Proportion of Inbound Exchange Students 2.5% |
|  | Proportion of Outbound Exchange Students 2.5% |

The 11 indicators used to compile the QS Asia University Rankings are as follows:

Academic reputation (30%)

This is assessed using data from the large global survey of academics conducted by QS each year. The results of this survey, which asks academics to identify the leading universities in their own subject area, also feed into other rankings and reports produced by QS, including the QS World University Rankings and the QS World University Rankings by Subject. The aim is to give an indication of which universities hold the strongest reputation within the international academic community.

Employer reputation (20%)

This is again assessed using the results of a major international survey, this time of graduate employers, who are asked to identify the universities they perceive as producing the highest-quality graduates. The results of this survey are used to inform a number of other QS research projects, reflecting the importance of employability and employment prospects for today's university applicants and graduates.

Faculty/student ratio (10%)

This indicator assesses the ratio of full-time academic staff members employed per student enrolled. The aim is to give an idea of how much contact time and academic support students at the institution may expect to receive.

International research network (10%)

Using data provided by Scopus, this indicator assesses the degree of international openness in terms of research collaboration for each evaluated institution. To calculate this indicator the Margalef Index, widely used in the environmental sciences, has been adapted to produce a score that gives an indication of the diversity of an institution's research collaborations with other institutions in different locations of the world.

Citations per paper (10%) and papers per faculty (5%)

These two indicators are both assessed using data from the [Scopus](#) database of research publications and citations. The first assesses the number of citations per research paper published, aiming to give an idea of the impact each institution's research is having within the research community. The second assesses the number of research papers published per faculty member. This provides an indication of the overall research productivity of the university.

Staff with a PhD (5%)

A new indicator introduced to the QS University Rankings: Asia for 2016, this assesses the proportion of academic staff members qualified to PhD level. This complements the faculty/student ratio indicator, both aiming to provide proxy measures of an institution's commitment to high-quality teaching.

Proportion of international faculty (2.5%) and proportion of international students (2.5%)

The final four indicators all aim to assess how 'international' each university is, reflecting the fact that internationalization is a major priority both for universities in Asia and in every world region. These two indicators, also used in the QS World University Rankings, assess the proportion of staff and students at the university who are classed as 'international'.

Proportion of inbound exchange students (2.5%) and proportion of outbound exchange students (2.5%)

These last two indicators, not used in the global ranking, offer additional insights into the internationalization activity at universities in Asia, assessing the relative size of each institution's inbound and outbound student exchange programs.

QS World University Rankings by Subject

(<http://www.iu.qs.com/university-rankings/subject-tables/>)

(<https://www.topuniversities.com/subject-rankings/methodology>)



These four components are combined to produce the results for each of the subject rankings, with weightings adapted for each discipline.

1. Academic reputation
2. Employer reputation
3. Research citations per paper
4. H-index

2020 QS WORLD UNIVERSITY RANKINGS BY SUBJECT

METHODOLOGY: DEFINITIONS & WEIGHTINGS



1. Academic reputation QS's global survey of academics has been at the heart of the QS World University Rankings® since their inception in 2004. In 2020, the QS World University Rankings by Subject draws on responses from nearly 95,000 academics worldwide.

Having provided their name, contact details, job title and the institution where they are based, respondents identify the countries, regions and faculty areas they are most familiar with, and up to two narrower subject disciplines in which they have expertise. For each of the (up to five) faculty areas they identify, respondents are asked to list up to 10 domestic and 30 international institutions which they consider to be excellent for research in the given area. They are not able to select their own institution.

For the QS World University Rankings by Subject, the results of the survey are filtered according to the narrow area of expertise identified by respondents. While academics can select up to two narrow areas of expertise, greater emphasis is placed on respondents who have identified only one.

2. Employer reputation

The QS World University Rankings are unique in incorporating employability as a key factor in the evaluation of international universities. In 2020, the QS World University Rankings by Subject draws on nearly 45,000 survey responses from graduate employers worldwide.

The employer reputation survey works on a similar basis to the academic one, but without the channelling for different faculty areas. Employers are asked to identify up to 10 domestic and 30 international institutions they consider excellent for the recruitment of graduates. They are also asked to identify the disciplines from which they prefer to recruit. By examining the intersection of these two questions, we can infer a measure of excellence in a given discipline.

3. Research citations per paper

For the QS World University Rankings by Subject we measure citations per paper, rather than citations per faculty member. This is due to the impracticality of reliably gathering faculty numbers broken down by discipline for each institution.

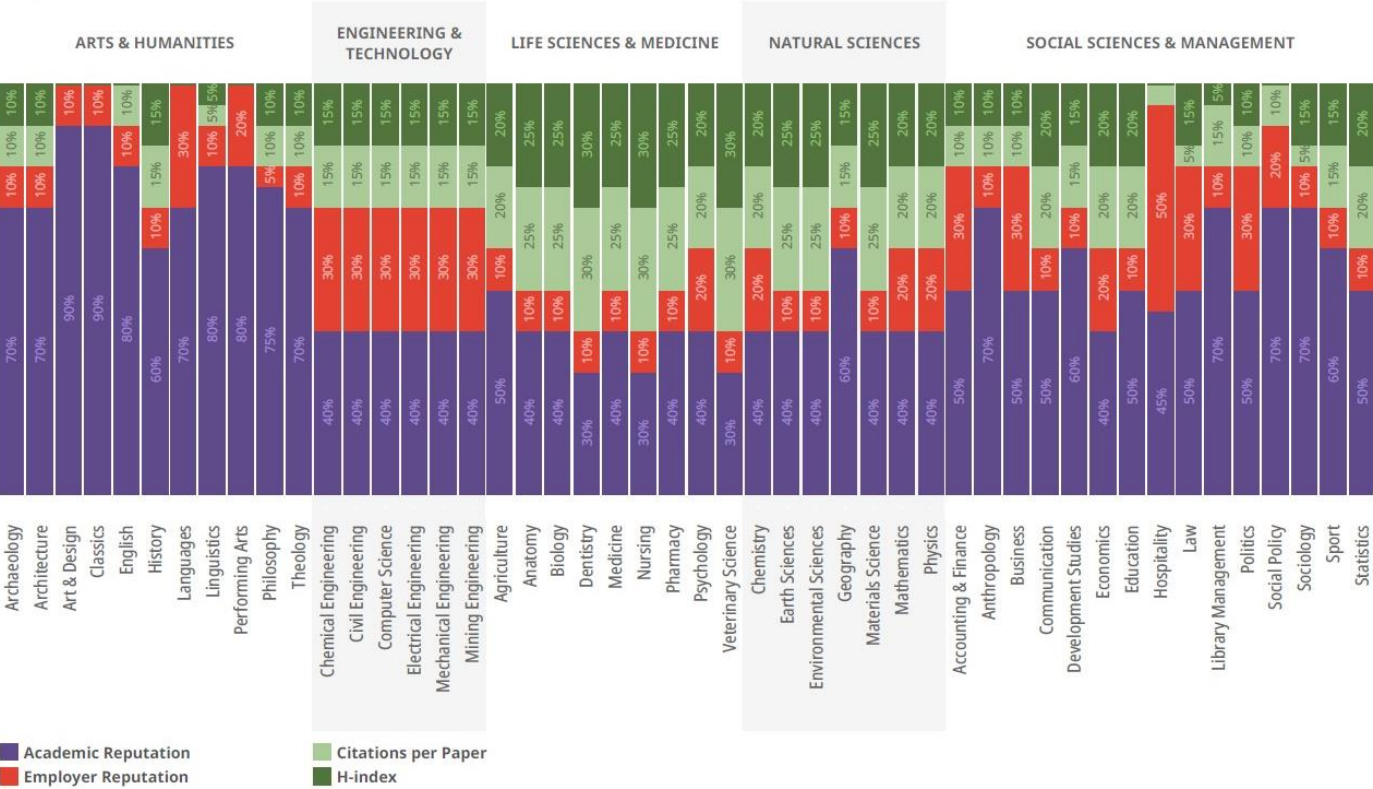
A minimum publication threshold is set for each subject to avoid potential anomalies stemming from small numbers of highly cited papers. Both the minimum publications threshold and the weighting applied to the citations indicator are adapted in order to best reflect prevalent publication and citation patterns in a given discipline. All citations data is sourced from the [Scopus](#), spanning a five-year period.

4. H-index

Since 2013, a score based on 'h-index' has also been incorporated in the QS World University Rankings by Subject. The h-index is a way of measuring both the productivity and impact of the published work of a scientist or scholar. The index is based on the set of the academic's most cited papers and the number of citations that they have received in other publications.

The h-index can also be applied to the productivity and impact of a group of scientists, such as a department, university or country, as well as a scholarly journal. The index was suggested by Jorge E. Hirsch, a physicist at UCSD, as a tool for determining theoretical physicists' relative quality, and is sometimes called the Hirsch index or Hirsch number.

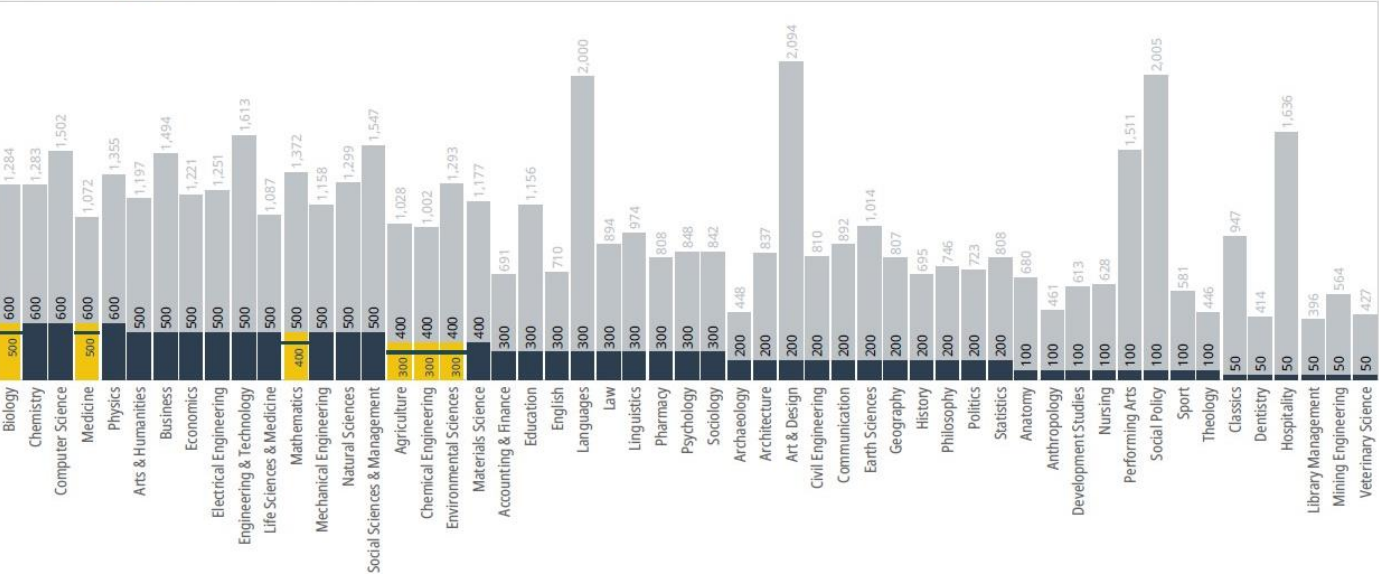
We use a variable approach to the weightings for the different subjects. The chart below provides details of the combinations used in the 2020 edition of the rankings.



The charts below present the number of institutions considered and published in each of the relevant subject areas.

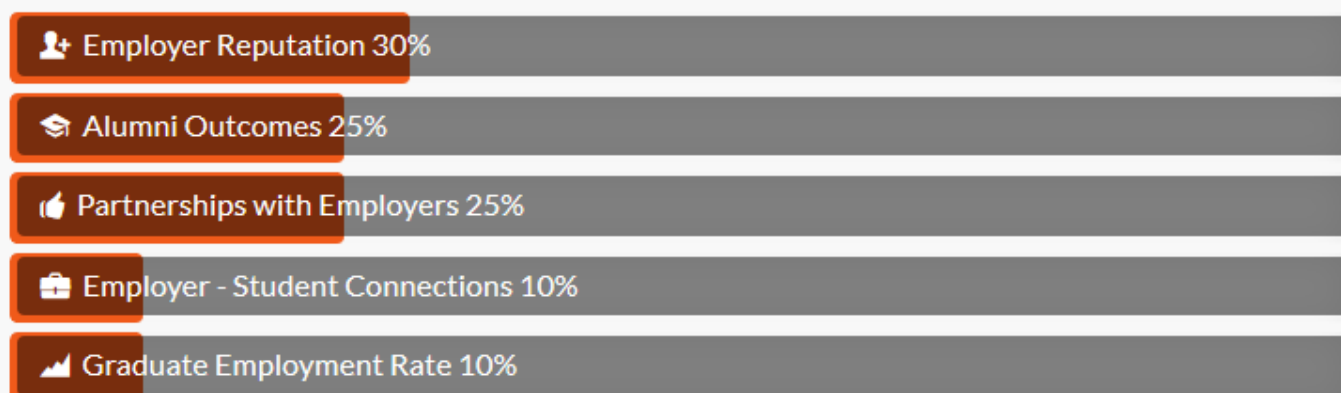


INSTITUTIONS CONSIDERED AND PUBLISHED BY SUBJECT - YEAR 2020
Subjects with highlight color have extended publishing ranges.





Indicators



Each institution's score is comprised of five carefully-chosen indicators. Employer Reputation excepted, all metrics used are, currently, unique to the QS Graduate Employability Rankings. These indicators and the main methodological enhancements introduced this year are described below:

Employer reputation (30%)

QS traditionally includes the Employer Reputation as a key performance area in all its ranking exercises. Of course, this metric adopts a leading role in a ranking focused solely on employability.

The Employer Reputation metric is based on almost 45,000 responses to the 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.

Alumni outcomes (25%)

A university that values the careers of its graduates tends to produce successful alumni. Here, QS have identified the alma maters of those individuals featuring in over 220 high-achievers lists, each measuring desirable outcomes in a particular walk of life. In total, QS have analyzed more than 40,000 of the world's most innovative, creative, wealthy, entrepreneurial, and/or philanthropic individuals to establish which universities are producing world-changing individuals. A higher weighting is applied to those individuals featured in lists focused on younger profiles, to ensure a high level of contemporary relevance. Likewise, undergraduate degrees have a higher weighting than post-graduate degrees, as it is assumed that the early stages of the higher education learning process are more formative in establishing an individual's employability.

Partnerships with Employers per Faculty (25%)

This indicator comprises two parts. First, it uses Elsevier's Scopus database to establish which universities are collaborating successfully with global companies to produce citable, transformative research. Only distinct companies producing two or more collaborative papers in a five-year period (2013-2017) are included in the count. This year's ranking accounts for university collaborations with 2,000 top global

companies, as listed by Fortune and Forbes.

Second, it considers work placement-related partnerships that are reported by institutions and validated by the QS research team.

Both figures are adjusted to account for the number of faculty at each university, and then combined into a composite index.

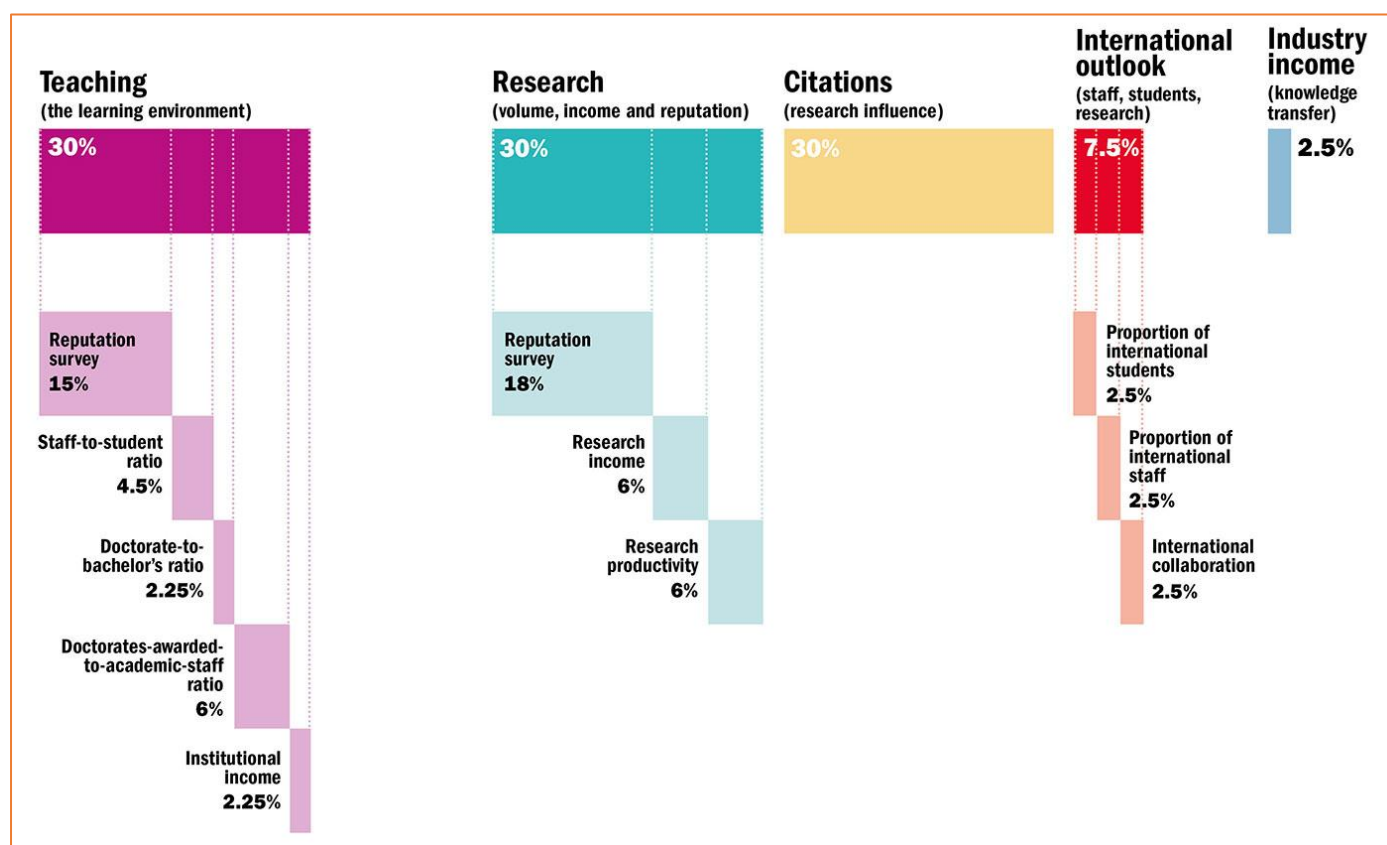
Employer/Student Connections (10%)

This indicator involves summing the number of individual employers who have been actively present on a university's campus over the past twelve months, providing motivated students with an opportunity to network and acquire information. Employer presence also increases the opportunities that students have to participate in career-launching internships and research opportunities. This 'active presence' may take the form of participating in careers fairs, organizing company presentations, or any other self-promoting activities.

This count is adjusted by the number of students, accounting for the size of each institution.

Graduate employment rate (10%)

This indicator is the simplest, but essential for any understanding of how successful universities are at nurturing employability. It involves measuring the proportion of graduates (excluding those opting to pursue further study or unavailable to work) in full or part time employment within 12 months of graduation. To calculate the scores, we consider the difference between each institution's rate and the average in the country in which they are based. To preclude significant anomalies, the results are adjusted by the range between the maximum and minimum values recorded in each country or region. This accounts for the fact that a university's ability to foster employability will be affected by the economic performance of the country in which they are situated.



The 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** (knowledge transfer).

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 between November 2018 and March 2019. It examined the perceived prestige of institutions in teaching. The responses were statistically representative of the global academy's geographical and subject mix. The 2019 data are combined with the results of the 2018 survey, giving more than 21,000 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.

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 our 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, 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.

To measure productivity we count the number of publications 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. Last year, we devised a method to give credit for papers that are published in subjects where a university declares no staff.

Citations (research influence): 30%

Our research influence indicator looks at universities' role in spreading new knowledge and ideas.

We examine research influence by capturing the average number of times a university's published work is cited by scholars globally. This year, our bibliometric data supplier Elsevier examined 77.4 million citations to 12.8 million journal articles, article reviews, conference proceedings, books and book chapters published over five years. The data include more than 23,400 academic journals indexed by Elsevier's Scopus database and all indexed publications between 2014 and 2018. Citations to these publications made in the six years from 2014 to 2019 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 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.

We have blended equal measures of a country-adjusted and non-country-adjusted raw measure of citations scores.

In 2015-16, we 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. In 2016-17, we designed a

method for reincorporating these papers. Working with Elsevier, we developed a 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.

International outlook (staff, students, research): 7.5%

- Proportion of international students: 2.5%
- Proportion of international staff: 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, 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.

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.

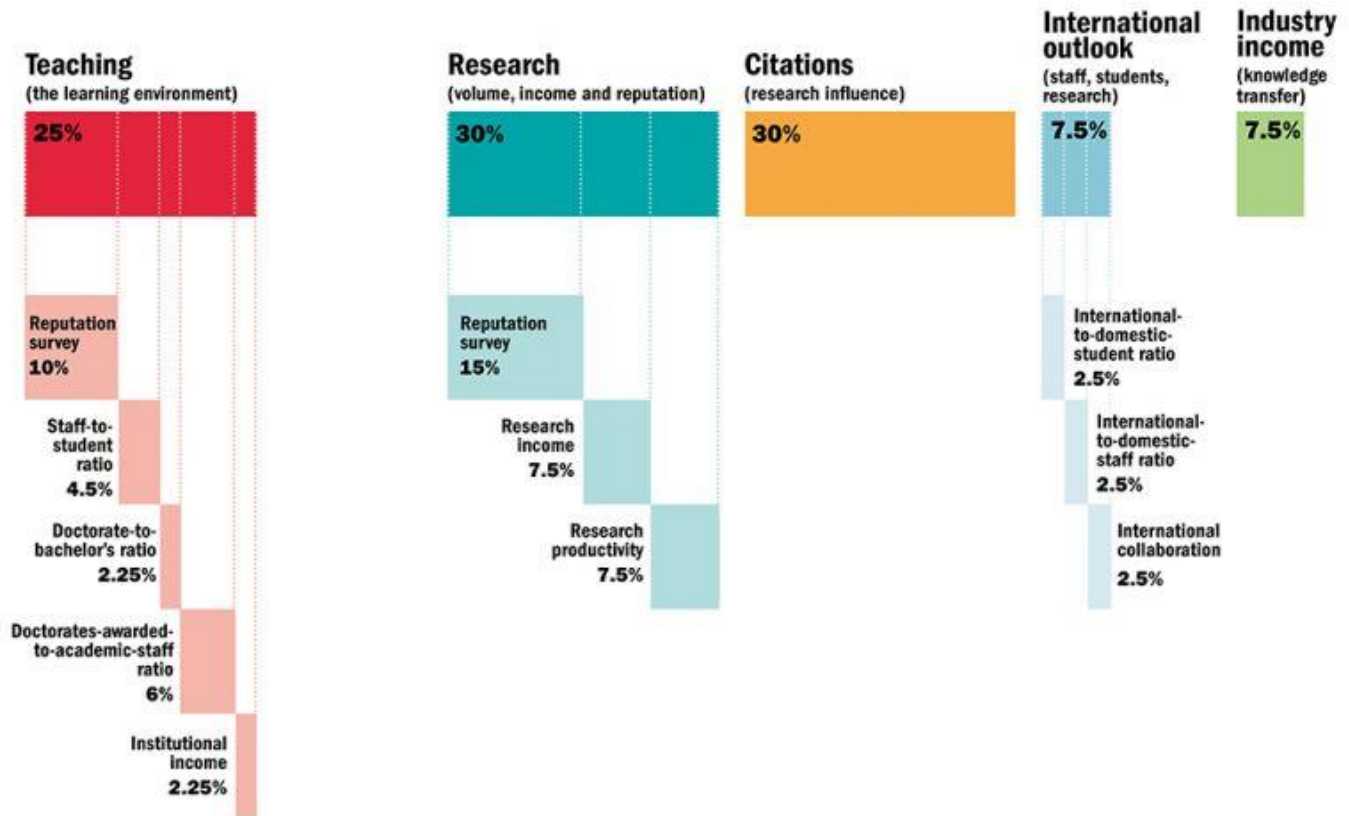
The category suggests the extent to which businesses are willing to pay for research and a university's ability to attract funding in the commercial marketplace – useful indicators of institutional quality.

Exclusions

Universities can be excluded from the World University Rankings if they do not teach undergraduates, or if their research output amounted to fewer than 1,000 relevant publications between 2014 and 2018 (with a minimum of 150 a year). Universities can also be excluded if 80 per cent or more of their research output is exclusively in one of our 11 subject areas.

(<https://www.timeshighereducation.com/world-university-rankings/asia-university-rankings-2019-methodology>)

The Asia University Rankings use the same 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons, trusted by students, academics, university leaders, industry and governments. However, the weightings are specially recalibrated to reflect the priorities of Asian institutions.



Teaching (the learning environment): 25%

- Reputation survey: 10%
- 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 2018. It examined the perceived prestige of institutions in teaching. We have worked hard to ensure a balanced spread of responses across disciplines and countries. Where disciplines or countries were over- or under-represented, *THE's* data team weighted the responses to more closely reflect the actual distribution of scholars. The 2018 data are combined with the results of the 2017 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. 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%

- Reputation survey: 15%
- Research income: 7.5%
- Research productivity: 7.5%

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 (see below).

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, 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.

To measure productivity we 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, we devised a method to give credit for papers that are published in subjects where a university declares no staff.

Citations (research influence): 30%

Our research influence indicator looks at universities' role in spreading new knowledge and ideas.

We examine research influence by capturing the average number of times a university's published work is cited by scholars globally. This year, our biblio-metric data supplier Elsevier examined 67.9 million citations to 14.1 million journal articles, article reviews, conference proceedings and books and book chapters published over five years. The data include more than 25,000 academic journals indexed by Elsevier's Scopus database and all indexed publications between 2013 and 2017. Citations to these publications made in the six years from 2013 to 2018 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 understanding, irrespective of discipline.

The data are normalised by the overall number of papers produced to reflect variations in citation volume between different subject areas. This means that large institutions or those with high levels of research activity in subjects with traditionally high citation counts do not gain an unfair advantage.

We have blended equal measures of a country-adjusted and non-country-adjusted raw measure of citations scores.

In 2015-16, we 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. In 2016-17, we designed a method for reincorporating these papers. Working with Elsevier, we 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.

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, 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.

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Times Higher Education

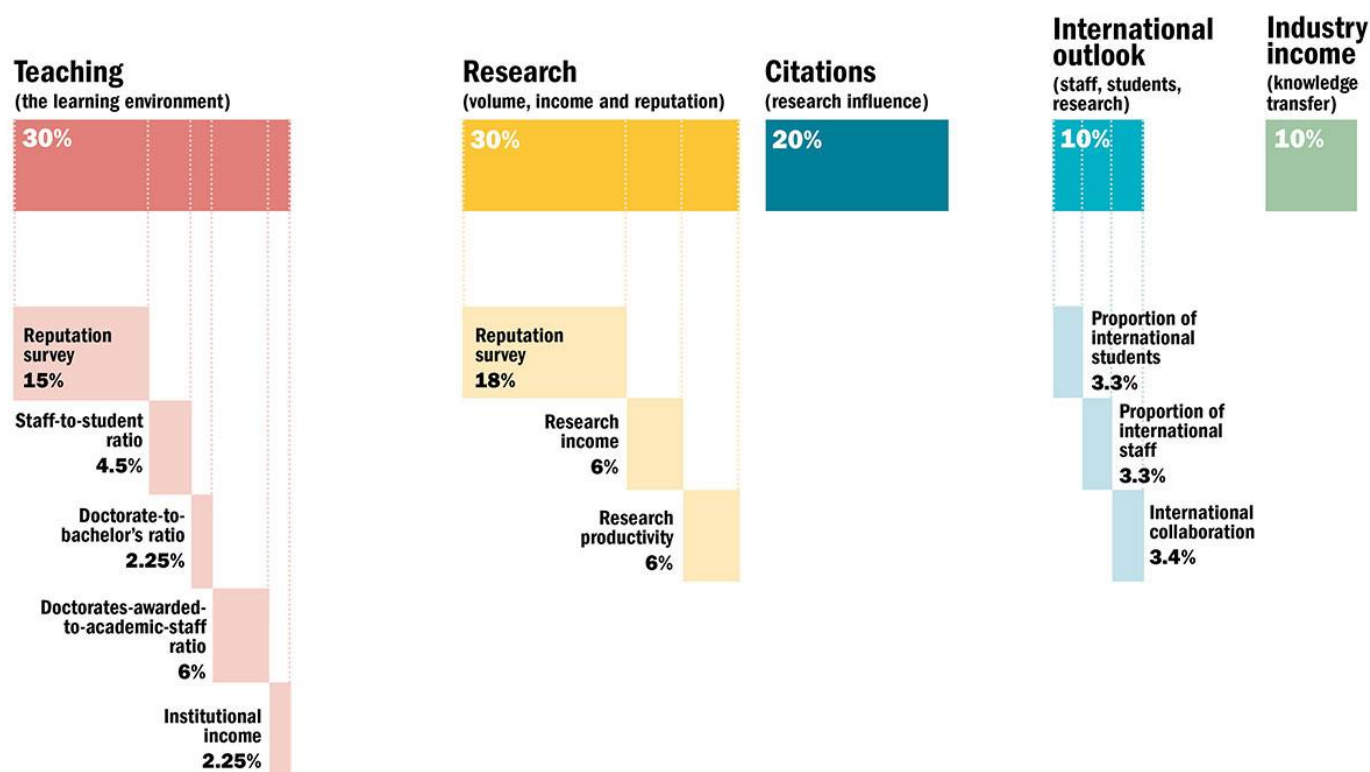
Emerging Economies University Rankings



(<https://www.timeshighereducation.com/emerging-economies-university-rankings-2020-methodology>)

The Emerging Economies University Rankings use the same 13 carefully calibrated performance indicators to provide the most comprehensive and balanced comparisons, trusted by students, academics, university leaders, industry and governments – but the weightings are specially recalibrated to reflect the characteristics of the emerging economy universities.

It includes only institutions in countries or regions classified by FTSE as “advanced emerging”, “secondary emerging” or “frontier”.



Teaching (the learning environment) – 30%

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International outlook (staff, students, research) – 10%

- Proportion of international students: 3.3%
- Proportion of international staff: 3.3%
- International collaboration: 3.4%

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, 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.

Industry income (knowledge transfer) – 10%

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.

Exclusions

Universities are excluded from the Emerging Economies University Rankings if they do not teach undergraduates or if their research output amounted to fewer than 1,000 articles between 2014 and 2018 (and a minimum of 150 a year). Universities can also be excluded if 80 per cent or more of their research output is exclusively in one of our 11 subject areas.

Times Higher Education

World University Rankings by Subject



(<https://www.timeshighereducation.com/world-university-rankings/by-subject>)

The subject tables employ the same range of 13 performance indicators used in the overall World University Rankings, brought together with scores provided under the same five pillars. However, within the subject rankings, the overall methodology is carefully recalibrated by subject, with the weightings changed to best suit the individual fields.

| | Indicator | Overall | A&H | Social | Bus & Eco | Clinical | Life | Phys | E&T | Comp Sci | Psycho | Law | Educ |
|----|-----------------------------|---------|---------|---------|-----------|----------|---------|---------|---------|----------|---------|---------|---------|
| C1 | Citations | 30.00% | 15.00% | 25.00% | 25.00% | 35.00% | 35.00% | 35.00% | 27.50% | 27.50% | 35.00% | 25.00% | 27.50% |
| E1 | Industry Income/Staff | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 5.00% | 5.00% | 2.50% | 2.50% | 2.50% |
| T1 | Teaching Reputation | 15.00% | 25.30% | 21.10% | 21.10% | 17.90% | 17.90% | 17.90% | 19.50% | 19.50% | 17.90% | 21.00% | 20.00% |
| T2 | Student to Staff Ratio | 4.50% | 3.80% | 3.30% | 3.30% | 2.80% | 2.80% | 2.80% | 3.00% | 3.00% | 2.80% | 4.50% | 4.50% |
| T3 | PhD/Bachelors | 2.25% | 1.80% | 1.60% | 0.00% | 1.40% | 1.40% | 1.40% | 1.50% | 1.50% | 1.40% | 0.00% | 0.00% |
| T4 | PhD/Staff | 6.00% | 4.60% | 4.80% | 4.90% | 4.00% | 4.00% | 4.00% | 4.50% | 4.50% | 4.00% | 4.90% | 6.00% |
| T5 | Income/Staff | 2.25% | 1.90% | 1.60% | 1.60% | 1.40% | 1.40% | 1.40% | 1.50% | 1.50% | 1.40% | 2.30% | 2.20% |
| R1 | Research Reputation | 18.00% | 30.00% | 22.80% | 22.80% | 19.30% | 19.30% | 19.30% | 21.00% | 21.00% | 19.30% | 21.00% | 20.00% |
| R2 | Research Income/Staff | 6.00% | 3.80% | 4.90% | 4.90% | 4.10% | 4.10% | 4.10% | 4.50% | 4.50% | 4.10% | 4.90% | 4.90% |
| R3 | Papers/Staff | 6.00% | 3.80% | 4.90% | 4.90% | 4.10% | 4.10% | 4.10% | 4.50% | 4.50% | 4.10% | 4.90% | 4.90% |
| I1 | International Students | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% |
| I2 | International Staff | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% |
| I3 | International Co-authorship | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 2.50% | 3.00% | 2.50% |
| | Total | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Times Higher Education World Reputation Rankings

(<https://www.timeshighereducation.com/world-university-rankings/world-reputation-rankings-2019-methodology>)

The Academic Reputation Survey, available in 16 languages, uses United Nations data as a guide to ensure that the response coverage is as representative of world scholarship as possible. It is also evenly spread across academic disciplines.

The questionnaire, which is administered on behalf of *THE* by Elsevier, targets only experienced, published scholars, who offer their views on excellence in research and teaching within their disciplines and at institutions with which they are familiar.

The 2019 rankings are based on a survey carried out between November 2018 and February 2019, which received a total of 11,554 responses from 135 countries.

In the survey, scholars are questioned at the level of their specific subject discipline. They are not asked to create a ranking themselves or to list a large range of institutions; they only name at most 15 universities that they believe are the best in each category (research and teaching), based on their own experience.

The survey data will be used alongside 11 objective indicators to help create the *THE* World University Rankings 2020, which will be unveiled in September 2019.

The reputation table ranks institutions according to an overall measure of their esteem that combines data on their reputation for research and teaching.

The two scores are combined at a ratio of 2:1, giving more weight to research because our expert advisers have suggested that there is greater confidence in respondents' ability to make accurate judgements about research quality.

The scores are based on the number of times that an institution is cited by respondents as being the best in their field. The number one institution, [Harvard University](#), was the one selected most often. The scores for all other institutions in the table are expressed as a percentage of Harvard's, which is set at 100.

(<https://www.timeshighereducation.com/university-impact-rankings-2020-methodology>)

There are 17 UN SDGs and we are evaluating university performance on all of them in our second edition of the ranking (click on a category below to view its specific methodology):

There are 17 UN SDGs and we are evaluating university performance on all of them in our second edition of the ranking:

- SDG 1 – [no poverty](#)
- SDG 2 – [zero hunger](#)
- SDG 3 – [good health and well-being](#)
- SDG 4 – [quality education](#)
- SDG 5 – [gender equality](#)
- SDG 6 – [clean water and sanitation](#)
- SDG 7 – [affordable and clean energy](#)
- SDG 8 – [decent work and economic growth](#)
- SDG 9 – [industry, innovation and infrastructure](#)
- SDG 10 – [reduced inequalities](#)
- SDG 11 – [sustainable cities and communities](#)
- SDG 12 – [responsible consumption and production](#)
- SDG 13 – [climate action](#)
- SDG 14 – [life below water](#)
- SDG 15 – [life on land](#)
- SDG 16 – [peace, justice and strong institutions](#)
- SDG 17 – [partnerships for the goals](#)

Universities can submit data on as many of these SDGs as they are able. Each SDG has a series of metrics that are used to evaluate the performance of the university on that SDG.

Any university that provides data on SDG 17 and at least three other SDGs is included in the overall ranking.

As well as the overall ranking, we also publish the results of each individual SDG in 17 separate tables.

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1
NO
POVERTY



| | Metric | Evidence required | |
|-------|--|--|---|
| 1.i | Research | <ul style="list-style-type: none"> Research into poverty | 7 |
| 1.ii | Proportion of students receiving financial aid to attend university because of poverty | <ul style="list-style-type: none"> Number of students Number of students receiving significant financial aid | 7 |
| 1.iii | University anti-poverty programmes | <ul style="list-style-type: none"> Targets to admit students from the bottom two financial deciles Graduation/completion targets for students from the bottom two financial deciles (domestic) Provide support (e.g food, housing, transportation, legal services) for students from poorest families to enable them to complete university Programmes to assist students from the bottom two financial deciles to successfully complete their studies Schemes to support poor students from low income countries | 6 |
| 1.iv | Community anti-poverty programmes | <ul style="list-style-type: none"> Provide assistance in the local community assisting the start-up of sustainable businesses through relevant education or resources? Provide financial assistance to the local community assisting the start-up of sustainable businesses? Organise training or programmes to improve access to basic services for all Participate in policy work addressing poverty in all its forms? | 6 |



2
ZERO
HUNGER



| | Metric | Evidence required | |
|-------|---|--|---|
| 2.i | Research | <ul style="list-style-type: none"> Research into hunger | 7 |
| 2.ii | Campus food waste | <ul style="list-style-type: none"> Proportion of food wasted/discarded per person on campus | 5 |
| 2.iii | Student hunger | <ul style="list-style-type: none"> Programme to address student food insecurity/hunger Provide interventions to target hunger among students and staff (e.g. including supply and access to food banks/pantries) Provide sustainable food choices for all on campus, including vegetarian and vegan food Provide healthy and affordable food choices for all on campus | 5 |
| 2.iv | Proportion of graduates in agriculture including sustainability aspects | <p>We are looking for the number of students who were studying any aspect of food sustainability within an agricultural course and successfully completed the course</p> <ul style="list-style-type: none"> Number of graduates Number of graduates from a relevant agriculture course | 4 |
| 2.v | National hunger | <ul style="list-style-type: none"> Provide access on food security and sustainable agriculture knowledge/skills/technology to local farmers and food producers Provide events for local farmers and food producers to connect and transfer knowledge Provide access to university facilities (e.g. labs, technology, plant | 5 |



| | Metric | Evidence required |
|-------|---|---|
| 3.i | Research | <ul style="list-style-type: none"> Paper Views and Normalised Clinical Citations |
| 3.ii | Number graduating in health professions | <ul style="list-style-type: none"> number of graduates in most recent year number of graduates in health professions in most recent year |
| 3.iii | Health impact | <ul style="list-style-type: none"> Current collaborations with local or global health institutions to improve health & wellbeing outcomes Outreach programmes and projects in the local community to improve or promote health & wellbeing including hygiene, nutrition, family planning, sports, exercise, aging well, and other health and wellbeing related topics Share sports facilities with the local community, for instance with local schools or with the general public Provide students access to free sexual and reproductive health-care services including information and education services Provide students and staff with access to free mental health support Have a smoke free policy for the university |

7

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10



| | Metric | Evidence required |
|-------|---|--|
| 4.i | Research into pedagogy* | <ul style="list-style-type: none"> Views and Citescore |
| 4.ii | Number of graduates who gained primary school teaching qualifications | <ul style="list-style-type: none"> Number of graduates Number of graduates who gained primary school teaching qualifications |
| 4.iii | Lifelong learning opportunities provided | <ul style="list-style-type: none"> Provide access to educational resources for those not studying at the university Host events that are open to the general public: public lectures, community educational events Host events that are open to the general public: executive education programmes & vocational training Undertake educational outreach activities beyond campus – e.g. in local schools, in the community, including voluntary student-run schemes Have a policy that access to these activities is accessible to all, regardless of ethnicity, religion, disability or gender |
| 4.iv | Proportion of 1 st generation students | <ul style="list-style-type: none"> Number of students starting a first degree Number of first generation students starting a first degree |

7

6

6

7

5 GENDER EQUALITY



| | Metric | Evidence required | |
|-------|---|---|---|
| 5.i | Research* | <ul style="list-style-type: none"> Proportion of female authored papers and Citescore | 7 |
| 5.ii | First generation female | <ul style="list-style-type: none"> Number of women starting first degrees Number of first generation women starting first degrees | 4 |
| 5.iii | Access measures | <ul style="list-style-type: none"> Systematically measure/track women's application rate, acceptance/entry rate and study completion rate at the university A policy addressing women's applications, acceptance/entry, and participation Provide women's access schemes Encourage applications by women in subjects where they are underrepresented | 4 |
| 5.iv | Proportion of women in senior positions | <ul style="list-style-type: none"> Number of senior academic staff Number of female senior academic staff | 4 |
| 5.v | Admissions gender mix | <ul style="list-style-type: none"> Number of first degree graduates by subject area (STEM, Medicine, Arts & Humanities / Social Sciences) Number of female first degree graduates by subject area | 3 |
| 5.vi | Progress measures | <ul style="list-style-type: none"> A policy of non-discrimination against women A policy of non-discrimination for transgender people Maternity and paternity policies that support women's participation Accessible childcare facilities for students which allow recent mothers to attend university courses Childcare facilities for staff and faculty Women's mentoring schemes, in which at least 10% of female students participate Measurement/tracking of women's likelihood of graduating compared to men's, and schemes in place to close any gap A policy that protects those reporting discrimination from educational or employment disadvantage | 4 |

6 CLEAN WATER AND SANITATION



| | Metric | Evidence required | |
|-------|------------------------------|--|---|
| 6.i | Research | <ul style="list-style-type: none"> Research into water | 7 |
| 6.ii | Water consumption per person | <ul style="list-style-type: none"> Volume of water used per person (including students, staff, and faculty) on campus per year | 5 |
| 6.iii | Water usage and care | <ul style="list-style-type: none"> A process for the treatment of waste water Processes to prevent polluted water entering the water system, including pollution caused by accidents and incidents at the university Provide free drinking water for students, staff and visitors, (e.g. drinking water fountains) Apply building standards to minimise water use Plant landscapes to minimise water usage | 6 |
| 6.iv | Water reuse | <ul style="list-style-type: none"> Total volume of water recycled and reused as a percentage of the total water consumption | 3 |
| 6.v | Water in the community | <ul style="list-style-type: none"> Provide educational opportunities for local communities to learn about good water management Actively promote conscious water usage in the wider community Support water conservation off campus Utilise sustainable water extraction technologies on campus and associated university grounds Cooperate with local, regional, national and global governments on water security | 5 |



7

AFFORDABLE AND
CLEAN ENERGY

| | Metric | Evidence required | |
|-------|--------------------------|---|---|
| 7.i | Research | <ul style="list-style-type: none"> Energy research | 7 |
| 7.ii | University measures | <ul style="list-style-type: none"> Policies in place for ensuring all renovation / new builds are following energy efficiency standards Plans to upgrade existing buildings to higher energy efficiency Process for carbon management and to reduce carbon dioxide emissions Have an energy efficiency plan in place to reduce overall energy consumption Undergo energy reviews to identify areas where energy wastage is highest Have a policy on divesting investments from carbon-intensive energy industries especially coal and oil | 6 |
| 7.iii | Energy use density | <ul style="list-style-type: none"> Energy (GJ) used per m² floor space of the university buildings | 7 |
| 7.iv | Energy and the community | <ul style="list-style-type: none"> Help local community learn about importance of energy efficiency and clean energy Promote a pledge toward 100% renewable energy in the community Provide direct services to local industry aimed at improving energy efficiency and clean energy Inform and support government in clean energy and energy-efficient technology policy development Provide assistance for start-ups that foster and support a low-carbon economy/technology | 6 |



8

DECENT WORK AND
ECONOMIC GROWTH

| | Metric | Evidence required | |
|-------|-----------------------------------|---|---|
| 8.i | Research* | <ul style="list-style-type: none"> Citescore and Papers per staff | 7 |
| 8.ii | Employment practice | <ul style="list-style-type: none"> Pay all staff and faculty at least the living wage, defined as the local "living wage" or the local poverty indicator for a family of four Recognise unions & labour rights for all, including women & international staff A policy on discrimination in the workplace (including discrimination based on religion, sexuality, gender, age) A policy commitment to no forced labour, no modern slavery, no human trafficking and no child labour A policy on guaranteeing equivalent rights of workers if/when outsourcing activities to third parties A policy on pay scale equity including a commitment to measurement and elimination of gender pay gaps Measure/track pay scale gender equity A process for employees to appeal on employee rights and/or pay | 5 |
| 8.iii | Inward investment/economic impact | <ul style="list-style-type: none"> University income Number of employees | 4 |
| 8.iv | Employment placements | <ul style="list-style-type: none"> Number of students Number of students with work placements for more than a month | 5 |
| 8.v | Employment security | <ul style="list-style-type: none"> Number of employees Number of employees on contracts of over 24 months | 5 |



9

INDUSTRY, INNOVATION
AND INFRASTRUCTURE

| | Metric | Evidence required |
|-------|-----------------|--|
| 9.i | Research | <ul style="list-style-type: none"> Citescore |
| 9.ii | Patents | <ul style="list-style-type: none"> Patents that cite research |
| 9.iii | Spin-offs | <ul style="list-style-type: none"> Number of university spin-offs |
| 9.iv | Industry income | <ul style="list-style-type: none"> Research income by subject area (STEM, Medicine, Arts & Humanities / Social Sciences) Number of academic staff per subject area |

4

3

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10

REDUCED
INEQUALITIES

| | Metric | Evidence required |
|--------|---|--|
| 10.i | Research | <ul style="list-style-type: none"> Citescore, FWCI, and number of papers |
| 10.ii | First generation students | <ul style="list-style-type: none"> Number of students starting a first degree Number of first generation students starting a first degree |
| 10.iii | Percent of international students from developing nations receiving financial aid | <ul style="list-style-type: none"> Number of first degree students Number of first degree international students from low and lower middle income countries receiving financial aid |
| 10.iv | Percent of students with disabilities | <ul style="list-style-type: none"> Number of students with disabilities Number of students |
| 10.v | Percent of staff with disabilities | <ul style="list-style-type: none"> Number of employees with disabilities Number of employees |
| 10.vi | Measures against discrimination | <ul style="list-style-type: none"> Non-discriminatory admissions policy Tracking application and admission rates of under-represented groups Delivering programmes to recruit from under-represented groups Anti-discrimination and anti-harassment policies for staff and students The existence of a diversity and equality committee or officer Providing mentoring or other support programmes aimed at students and staff from under-represented groups Provide accessible facilities for people with disabilities Provide support services for people with disabilities Provide access schemes for people with disabilities Have reasonable accommodation policy/strategy implemented, including adequately funded mechanism for persons with disability |

7

4

4

3

3

5

11 SUSTAINABLE CITIES AND COMMUNITIES

| | Metric | Evidence required | |
|--------|----------------------------------|--|---|
| 11.i | Research | <ul style="list-style-type: none"> Citescore, FWCI, and number of papers | 7 |
| 11.ii | Arts and heritage | <ul style="list-style-type: none"> Provide public access to buildings and/or monuments of cultural significance Provide public access to libraries including books and publications Provide public access to museums, exhibition spaces / galleries and/or works of art and artifacts Provide free public access to open spaces and green spaces Contribute to local arts, in terms of number of annual public performances of university choirs / theatre groups / orchestras etc Deliver projects to record and/or preserve intangible cultural heritage such as local folklore, traditions, language, and knowledge | 6 |
| 11.iii | Spend on Local Arts and Heritage | <ul style="list-style-type: none"> University expenditure University expenditure on arts and heritage | 4 |
| 11.iv | Sustainable practices | <ul style="list-style-type: none"> Measure and set targets for more sustainable commuting Undertake actions to promote the % of more sustainable commuting Promote or allow telecommuting or remote working for employees as a matter of policy or standard practice, and/or offer a condensed working week to reduce employee commuting Provide affordable housing for employees Provide affordable housing for students Prioritise pedestrian access on campus Work with local authorities to address planning issues/development, including ensuring that local residents are able to access affordable housing Build new buildings to sustainable standards (if 'yes', are you following a national standard or body) Build on brownfield sites, where possible | 9 |

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

| | Metric | Evidence required | |
|--------|--------------------------------------|--|---|
| 12.i | Research* | <ul style="list-style-type: none"> Citescore, FWCI, and number of papers | 7 |
| 12.ii | Operations | <ul style="list-style-type: none"> A policy on ethical sourcing of food and supplies A policy on waste disposal Policies around use minimisation Do these policies extend to outsourced suppliers and the supply chain | 7 |
| 12.iii | Percentage of waste recycled | <ul style="list-style-type: none"> Amount of waste generated Amount of waste recycled Amount of waste sent to landfill | 7 |
| 12.iv | Publication of sustainability report | <ul style="list-style-type: none"> Is the report annual, bi-annual or less frequent | 5 |



| | Metric | Evidence required | |
|--------|---|--|---|
| 13.i | Research | <ul style="list-style-type: none"> Citescore, FWCI, and number of papers | 7 |
| 13.ii | Low carbon energy use | <ul style="list-style-type: none"> Total energy used Electricity from low-carbon sources | 7 |
| 13.iii | Environmental Education including Disaster Planning | <ul style="list-style-type: none"> Provide local education programmes or campaigns on climate change risks, impacts, mitigation, impact reduction and early warning A Climate Action plan, shared with local government and/or local community groups Participate in co-operative planning for climate change disasters, working with government Inform and support local or regional government in local climate change disaster/risk early warning and monitoring Collaborate with NGOs on climate adaptation | 6 |
| 13.iv | Commitment to carbon neutral university | <ul style="list-style-type: none"> Year of commitment | 6 |



| | Metric | Evidence required | |
|--------|---|--|---|
| 14.i | Research | <ul style="list-style-type: none"> Research into aquatic ecosystems | 7 |
| 14.ii | Supporting aquatic ecosystems through education | <ul style="list-style-type: none"> Offer educational programmes on fresh-water ecosystems for local or national communities Offer educational outreach for local or national communities on sustainable management of fisheries, aquaculture and tourism Offer educational outreach activities for local or national communities to raise awareness about overfishing, illegal, unreported and unregulated fishing and destructive fishing practices | 4 |
| 14.iii | Supporting aquatic ecosystems through action | <ul style="list-style-type: none"> Support or organise events that promote conservation and sustainable use of oceans, seas, lakes, rivers and marine resources Policies to ensure that food on campus that comes from aquatic ecosystems is sustainably harvested Work directly to maintain and extend ecosystems and their biodiversity, especially ecosystems under threat Work directly on technologies or practices that enable marine industry to minimise or prevent damage to aquatic ecosystems | 5 |
| 14.iv | Water sensitive waste disposal | <ul style="list-style-type: none"> Have water quality standards and guidelines for water discharges Action plan to reduce plastic waste on campus Policy on preventing and reducing marine pollution of all kinds, in particular from land-based activities | 5 |
| 14.v | Maintaining a local ecosystem | <ul style="list-style-type: none"> A plan to minimise physical, chemical and/or biological alterations of related aquatic ecosystems Monitor the health of aquatic ecosystems Develop and support programs and incentives that encourage and maintain good aquatic stewardship practices Collaborate with the local community in efforts to maintain shared aquatic ecosystems Apply a watershed management strategy based on location specific diversity of aquatic species | 5 |



| | Metric | Evidence required | |
|--------|--|--|---|
| 15.i | Research | <ul style="list-style-type: none"> Research into land ecosystems | 7 |
| 15.ii | Supporting land ecosystems through education | <ul style="list-style-type: none"> Support and/or organise events aimed to promote conservation and sustainable utilisation of the land, including forests and wild land Policies to ensure that food on campus is sustainably farmed Work directly to maintain and extend ecosystems and their biodiversity especially ecosystems under threat Offer educational programmes on ecosystems (looking at wild flora and fauna) for local or national communities Offer educational outreach for local or national communities on sustainable management of land for agriculture and tourism | 6 |
| 15.iii | Supporting land ecosystems through action | <ul style="list-style-type: none"> Policy to ensure the conservation, restoration and sustainable use of terrestrial ecosystems associated with the university, in particular forests, mountains and drylands Policies to identify, monitor and protect any IUCN Red Listed species and national conservation list species with habits in areas affected by the operation of your university Include local biodiversity into any planning and development process Policies to reduce the impact of alien species on Campus Collaborate with the local community in efforts to maintain shared land ecosystems | 7 |
| 15.iv | Land sensitive waste disposal | <ul style="list-style-type: none"> Water quality standards and guidelines for water discharges Policy on reducing plastic waste on campus Policy on waste disposal - covering hazardous materials? | 6 |



| | Metric | Evidence required | |
|--------|---|---|---|
| 16.i | Research: Law and IR | <ul style="list-style-type: none"> Citescore, FWCI, and number of papers | 7 |
| 16.ii | Governance | <ul style="list-style-type: none"> Have elected representation on the university's highest governing body Recognise a students' union Policies and procedures to identify local stakeholders external to the university and engage with them Participatory bodies that recognize and engage local stakeholders, including local residents, local government, local private, local civil society representatives Publish the university's principles and commitments on organized crime, corruption & bribery Policy on supporting academic freedom Publish university financial data | 7 |
| 16.iii | Participation in local, regional and national government (and others) | <ul style="list-style-type: none"> Provide specific expert advice to local, regional or national government Provide outreach, general education, upskilling and capacity-building to policy- and law-makers on relevant topics e.g. economics, law, technology, climate change Undertake policy-focused research in collaboration with government departments Provide a neutral platform and 'safe' space for different political stakeholders to come together to frankly discuss challenges | 6 |
| 16.iv | Graduates in law and civil enforcement related courses | <ul style="list-style-type: none"> Number of graduates Number of graduates from law and civil enforcement related courses | 6 |



| | Metric | Evidence required | |
|--------|--|---|---|
| 17.i | Proportion of all SDG research with international coauthorship | <ul style="list-style-type: none"> Proportion of all SDG research with (international) coauthors from Lower Income countries | 6 |
| 17.ii | Relationships with NGOs, Regional and National Government | <ul style="list-style-type: none"> Have direct involvement in, or input into, national government SDG policy development Initiate and participate in cross-sectoral dialogue about the SDGs Participate in international collaboration on gathering or measuring data for the SDGs Through international collaboration and research, review comparative approaches and develop international best practice on tackling the SDGs Collaborate with NGOs to tackle the SDGs | 4 |
| 17.iii | Publish outputs across all SDGs | <ul style="list-style-type: none"> Which of the 11 SDGs does your university publish outputs for | 6 |
| 17.iv | Education for the SDGs | <ul style="list-style-type: none"> A commitment to meaningful education around the SDGs across the university | 6 |

$$\begin{array}{ccccccc}
 \textcircled{17} & + & \textcircled{A} & + & \textcircled{B} & + & \textcircled{C} \\
 22\% & & 26\% & & 26\% & & 26\%
 \end{array}$$

U.S. News Best Global Universities Rankings

(<https://www.usnews.com/education/best-global-universities/articles/methodology>)



| Ranking indicator | Weight |
|---|--------|
| Global research reputation | 12.50% |
| Regional research reputation | 12.50% |
| Publications | 10% |
| Books | 2.50% |
| Conferences | 2.50% |
| Normalized citation impact | 10% |
| Total citations | 7.50% |
| Number of publications that are among the 10 percent most cited | 12.50% |
| Percentage of total publications that are among the 10 percent most cited | 10% |
| International collaboration | 5% |
| Percentage of total publications with international collaboration | 5% |
| Number of highly cited papers that are among the top 1 percent most cited in their respective field | 5% |
| Percentage of total publications that are among the top 1 percent most highly cited papers | 5% |

Reputation Indicators

Results from Clarivate Analytics' [Academic Reputation Survey](#) aggregated for the most recent five years were used to create the two reputation indicators used in U.S. News' ranking analysis.

The survey, which aimed to create a comprehensive snapshot of academics' opinions about world universities, asked respondents to give their views of programs in the disciplines with which they were familiar. This method allowed respondents to rate universities at the field and department level, rather than at the institution level, creating a more specific and accurate measurement of a university's reputation as a whole.

To appropriately represent all regions, Clarivate Analytics took steps to overcome language bias, differing response rates and the geographic distribution of researchers. These steps included:

- Sending an invitation-only survey to academics selected from Clarivate Analytics' databases of published research, based on the estimated geographic proportions of academics and researchers around the world.
- Providing accessibility in seven languages.
- Rebalancing the survey's final results based on the geographic distribution of researchers to overcome differing response rates.
- Excluding respondents' nominations of their own institution or alma mater.

Respondents also self-declared their job role:

- 68% academic staff.
- 13% research staff.
- 8% senior institutional leaders.
- 4% graduate/postgraduate students.
- 7% other jobs and roles.

The total number of unique respondents was more than 26,810. The survey results were used in two separate ranking indicators, as follows.

Global research reputation (12.5%): This indicator reflects the aggregation of the most recent five years of results of the Academic Reputation Survey for the best universities globally for research.

Regional research reputation (12.5%): This indicator reflects the aggregation of the most recent five years of results of the Academic Reputation Survey for the best universities for research in the region; regions were determined based on the [United Nations definition](#).

This regional indicator had the effect of significantly increasing the international diversity of the rankings, since it focused on measuring academics' opinions of other universities within their region. The U.S. News rankings are the only global rankings to use this indicator, and the 2020 edition marks the sixth year of its inclusion.

Bibliometric Indicators

The bibliometric indicators used in the U.S. News ranking analysis are based on data from Clarivate Analytics' [Web of Science](#) for the five-year period from 2013 to 2017. The Web of Science is a web-based research platform that covers more than 18,000 of the most influential and authoritative scholarly journals worldwide in the sciences, social sciences, and arts and humanities.

Publications (10%): This is a measure of the overall research productivity of a university, based on the total number of scholarly papers – reviews, articles and notes – that contain affiliations to a university and are published in high-quality, impactful journals. This indicator is closely linked to the university's size. It is also influenced by the university's discipline focus, since some disciplines, particularly medicine, publish more than others.

Books (2.5%): Books are an important medium of publication for scholarly research, particularly in the social sciences and arts and humanities. The use of this ranking indicator provides a useful supplement to the data on articles and better represents universities that have a focus on social sciences and arts and humanities.

Conferences (2.5%): Academic conferences are an important venue for scholarly communication, particularly in disciplines tied to engineering and computer science. The formal publication of conference proceedings can represent genuine research breakthroughs in certain fields that may not have been documented or published elsewhere.

Normalized citation impact (10%): The total number of citations per paper represents the overall impact of the research of the university and is independent of the university's size or age; the value is normalized to overcome differences in research area, the paper's publication year and publication type.

NCI is considered one of the core measures of research performance and is used by various research evaluation bodies globally. The subject fields used in the analysis came from Clarivate Analytics InCites, which helps institutions evaluate research output, performance and trends; understand the scope of an organization's scholarly contributions; and articulate outcomes to inform research priorities. InCites uses the content and citation indicators found in the Web of Science.

Total citations (7.5%): This indicator measures how influential the university has been on the global research community. It is determined by multiplying the publications ranking factor by the normalized

citation impact factor. Total citations have been normalized to overcome differences in research area, publication year of the paper and publication type.

Number of publications that are among the 10% most cited (12.5%): This indicator reflects the number of papers that have been assigned as being in the top 10% of the most highly cited papers in the world for their respective fields. Each paper is given a percentile score that represents where it falls, in terms of citation rank, compared with similar papers – those with the same publication year, subject and document type.

Since the number of highly cited papers is dependent on the university's size, the indicator can be considered a robust indication of how much excellent research the university produces.

Percentage of total publications that are among the 10% most cited (10%): This indicator is the percentage of a university's total papers that are in the top 10% of the most highly cited papers in the world – per field and publication year. It is a measure of the amount of excellent research the university produces and is independent of the university's size.

International collaboration – relative to country (5%): This indicator is the proportion of the institution's total papers that contain international co-authors divided by the proportion of internationally co-authored papers for the country that the university is in. It shows how international the research papers are compared with the country in which the institution is based. International collaborative papers are considered an indicator of quality, since only the best research will be able to attract international collaborators.

International collaboration (5%): This indicator is the proportion of the institution's total papers that contain international co-authors and is another measure of quality.

Scientific Excellence Indicators

Number of highly cited papers that are among the top 1% most cited in their respective field (5%): This highly cited papers indicator shows the volume of papers that is classified as highly cited in the Clarivate Analytics' service known as Essential Science Indicators. Highly cited papers in ESI are the top 1% in each of the 22 broad fields represented in the Web of Science, per year. They are based on the most recent 10 years of publications.

Highly cited papers are considered indicators of scientific excellence and top performance and can be used to benchmark research performance against subject field baselines worldwide. This is a size-dependent measure.

Percentage of total publications that are among the top 1% most highly cited papers (5%): This percent of highly cited papers shows the number of highly cited papers for a university divided by the total number of documents it produces, represented as a percentage. It is a measure of excellence and shows the percentage of an institution's output that is among the most impactful papers in the world. This is a size-independent measure.

How the Overall Global Scores and Numerical Rankings Were Calculated

To arrive at a school's rank, the overall global scores were calculated using a combination of the weights and z-scores for each of the 13 indicators used in the rankings. In statistics, a z-score is a standardized score that indicates how many standard deviations a data point is from the mean of that variable. This

transformation of the data is essential when combining diverse information into a single ranking because it allows for fair comparisons between the different types of data.

Some of the indicators were highly skewed, so the logarithmic transformation of the original values was used. These indicators were:

- Publications.
- Books.
- Conferences.
- Total citations.
- Number of publications that are among the 10% most cited.
- Global research reputation.
- Regional research reputation.
- Number of highly cited papers that are among the top 1% most cited in their respective field.
- International collaboration.

The logarithmic transformation rescaled the data and allowed for a more normalized and uniform spread across each of the indicators. After these nine indicators were normalized, the z-scores for each indicator were calculated to standardize the different types of data to a common scale.

To reach a school's overall global score, the calculated z-scores for each of the 13 indicators were then weighted using the assigned weights described earlier. U.S. News determined the weights based on our judgment of the relative importance of the ranking factors and in consultation with bibliometric experts.

The overall global score for each school was calculated by summing the school's weighted values for each indicator. The minimum score from the pool of 1,599 institutions was then subtracted from each of the scores to make zero the lowest possible score.

The scores were then rescaled by multiplying the ratio between the overall performance of each university and the highest-performing university by 100. This forced the scores to fall on a zero to 100 scale, with the highest-performing school earning an overall global score of 100.

The top 1,500 universities out of the 1,599 ranked were then numerically ranked in descending order from 1 to 1,500 based on their weighted, rescaled overall global score. Each school's overall global score was rounded to one decimal place to increase variance between scores and to minimize the occurrence of ties.

In addition, the 1,599 universities received a numerical rank for all 13 ranking indicators – such as publications, total citations and global research reputation – based on their z-score for that indicator. The highest-scoring university for each of the 13 indicators received a rank of 1 and the lowest-scoring university – except for regional research reputation – received a rank of 1,599. Ties were allowed.

The regional research reputation numerical ranking is calculated based on the schools within each of the six U.N. regions. Those six regions are Africa, Asia, Australia/New Zealand, Europe, Latin America and North America. This means the regional reputation numerical ranking has six No. 1 schools – one for each region in the overall rankings. This regional research reputation ranking enables users to make comparisons to determine which schools have the strongest regional research reputation among the schools in their geographic region.

(<http://greenmetric.ui.ac.id/>)

a. The criteria

This year's categories and weighting of points are shown as follows.

Table 1 Categories used in the ranking and their weighting

| No | Category | Percentage of Total Points (%) |
|--------------|---------------------------------|--------------------------------|
| 1 | Setting and Infrastructure (SI) | 15 |
| 2 | Energy and Climate Change (EC) | 21 |
| 3 | Waste (WS) | 18 |
| 4 | Water (WR) | 10 |
| 5 | Transportation (TR) | 18 |
| 6 | Education (ED) | 18 |
| TOTAL | | 100 |

The specific indicators and their points awarded are shown in Table 2. Each indicator has been uniquely identified by a category code and a number (e.g. SI 5).

Table 2 Indicators and categories suggested for use in the 2019 ranking

| No | Categories and Indicators | Points | Weighting |
|----------|---|--------|------------|
| 1 | Setting and Infrastructure (SI) | | 15% |
| SI 1 | The ratio of open space area to the total area | 300 | |
| SI 2 | Total area on campus covered in forest vegetation | 200 | |
| SI 3 | Total area on campus covered in planted vegetation | 300 | |
| SI 4 | Total area on campus for water absorption besides the forest and planted vegetation | 200 | |
| SI 5 | The total open space area divided by total campus population | 300 | |
| SI 6 | Percentage of university budget for sustainability efforts within a year | 200 | |
| | Total | 1500 | |
| 2 | Energy and Climate Change (EC) | | 21% |
| EC 1 | Energy efficient appliances usage | 200 | |
| EC 2 | Smart building implementation | 300 | |
| EC 3 | Number of renewable energy sources in campus | 300 | |
| EC 4 | The total electricity usage divided by the total campus population | 300 | |
| EC 5 | The ratio of renewable energy production divided by total energy usage per year | 200 | |

| No | Categories and Indicators | Points | Weighting |
|----------|--|--------|------------|
| EC 6 | Elements of green building implementation as reflected in all construction and renovation policies | 300 | |
| EC 7 | Greenhouse gas emission reduction program | 200 | |
| EC 8 | The total carbon footprint divided by total campus population | 300 | |
| | Total | 2100 | |
| 3 | Waste (WS) | | 18% |
| WS 1 | Recycling program for university waste | 300 | |
| WS 2 | Program to reduce the use of paper and plastic on campus | 300 | |
| WS 3 | Organic waste treatment | 300 | |
| WS 4 | Inorganic waste treatment | 300 | |
| WS 5 | Toxic waste treatment | 300 | |
| WS 6 | Sewage disposal | 300 | |
| | Total | 1800 | |
| 4 | Water (WR) | | 10% |
| WR 1 | Water conservation program implementation | 300 | |
| WR 2 | Water recycling program implementation | 300 | |
| WR 3 | Water efficient appliances usage | 200 | |
| WR 4 | Treated water consumed | 200 | |
| | Total | 1000 | |
| 5 | Transportation (TR) | | 18% |
| TR 1 | The total number of vehicles (cars and motorcycles) divided by total campus population | 200 | |
| TR 2 | Shuttle services | 300 | |
| TR 3 | Zero Emission Vehicles (ZEV) policy on campus | 200 | |
| TR 4 | The total number of Zero Emission Vehicles (ZEV) divided by total campus population | 200 | |
| TR 5 | The ratio of the parking area to total campus area | 200 | |
| TR 6 | Transportation program designed to limit or decrease the parking area on campus for the last 3 years (from 2016 to 2018) | 200 | |
| TR 7 | Number of transportation initiatives to decrease private vehicles on campus | 200 | |
| TR 8 | Pedestrian path policy on campus | 300 | |
| | Total | 1800 | |
| 6 | Education and Research (ED) | | 18% |
| ED 1 | The ratio of sustainability courses to total courses/subjects | 300 | |
| ED 2 | The ratio of sustainability research funding to total research funding | 300 | |
| ED 3 | Number of scholarly publications on sustainability | 300 | |
| ED 4 | Number of events related to sustainability | 300 | |
| ED 5 | Number of student organizations related to sustainability | 300 | |
| ED 6 | University-run sustainability website | 200 | |
| ED 7 | Sustainability report | 100 | |
| | Total | 1800 | |