



Subject Rankings Q&A

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Subject Rankings Q&A

Question1: When and how was your subject ranking system developed? (a brief history)

U.S. News: U.S. News launched its Best Global Universities in 2014. At that time we produced 21 subject rankings and ranked the Top 100 in each subject. In the Best Global rankings published in 2015 we expanded the number of subjects ranked to 22 and increased the number of schools ranked in the many of subjects to up to 250 in some cases. U.S. News also does subject rankings as part of our “national rankings” Best Colleges and Best Graduates Schools. In our Best Colleges rankings we have been rankings U.S. degree programs in undergraduate business and undergraduate engineering annually since around 2000. Every rankings we do in Best Graduate schools is a subject rankings of U.S. programs. We have been doing Best Graduate schools annually starting in 1990.

ARWU: Ever since its publication, Academic Ranking of World Universities (ARWU) has been attracting attentions from all over the world. Numerous requests have been received, asking us to provide a ranking of world universities by broad subject fields or by schools and colleges. For example, identify the good specialized institutions which the overall ranking might not include.

In response to these requests, we have tried to rank world universities by broad subject fields, the results were first published on the website (<http://www.shanghairanking.com/>) in 2007. ARWU-FIELD includes five broad subject fields, which are Natural Sciences and Mathematics, Engineering/Technology and Computer Sciences, Life and Agriculture Sciences, Clinical Medicine and Pharmacy, and Social Sciences. Rankings on selected five subject fields — ARWU-SUBJECT were first published on the website (<http://www.shanghairanking.com/>) in 2009, which are Mathematics, Physics, Chemistry, Computer Sciences and Economics/Business.

QS: There is a clear demand for ways to compare the effectiveness of institutions in narrower subject disciplines. The QS World University Rankings® have been in existence since 2004, but since 2011 the study has been extended to encompass a range of popular individual subjects. Facing challenges relating to availability and applicability of data within different countries, QS World University Rankings by Subject has been narrowed to include only four indicators and year by year, QS aims to add more depth, more detail and more subjects to this work and anticipates that these tables will, in time, become more important than the overall result.

Times: Times Higher Education has been publishing a world university ranking since 2004, but it was only in 2010, when we launched a new and much improved methodology, that we were in a position to publish comprehensive data at the broad subject level. Using the same methodology as the overall World University Rankings (that is, 13 separate performance indicators covering the full range of a university’s core activities – the teaching environment, research, knowledge transfer and international outlook <https://www.timeshighereducation.com/news/ranking-methodology-2016>) we published a top 100 table in six broad areas.

U-Multirank: After a two year feasibility study which included an empirical pilot with about 180 universities, U-Multirank was first published in 2014. In the first year UMR presented data on > 500 HEIS on the institutional level and for four subjects (business studies, physics, mechanical and electrical engineering). Since then we extended UMR in two releases (May 2015, April 2016) both in terms of institutions included (1,300 in 2016) and of subjects covered (13 in 2016). In addition to the interactive,

personalized ranking tool U-Multirank offers a set of “readymade” rankings which focus on a particular combination of institution profiles and performance indicators.

Question2: Please describe the structure and categories of your subject rankings, and if applicable in what ways is your subject ranking system different from other international rankings? (uniqueness)

U.S. News: U.S has written a very detailed methodology that describes all aspects of the subject rankings at this link: (<http://www.usnews.com/education/best-global-universities/articles/subject-rankings-methodology>).

The first step was to determine the 22 subject areas that U.S. News ranks. These are listed below in this table.

Hard sciences	Soft Sciences	Arts and humanities
Agricultural sciences	Computer science	Arts and humanities
Biology and biochemistry	Economics and business	
Chemistry	Engineering	
Clinical medicine	Mathematics	
Environment/ecology	Social sciences and public health	
Geosciences		
Immunology		
Materials science		
Microbiology		
Molecular biology and genetics		
Neuroscience and behavior		
Pharmacology and toxicology		
Physics		
Plant and animal science		
Psychiatry/psychology		
Space science		

The next step was to calculate the 22 separate subject rankings using the ranking factors U.S. News selected. The new arts and humanities ranking used 10 ranking factors; the other 21 subject rankings used eight ranking factors, as was done in the inaugural edition of the Best Global Universities rankings.

Each indicator used in the subject rankings was based on bibliometric and global and regional reputation data compiled for that specific subject. For example, for the Best Global Universities for Clinical Medicine rankings, each of the eight rankings factors used in the calculations was based on data and values for clinical medicine.

ARWU:

- 1) The ARWU-SUBJECT uses objective indicators only.

Institutions are ranked according to their academic or research performance in each subject field. Ranking indicators include alumni and staff winning Nobel Prizes (**Alumni**), Fields Medals and Turing Awards (**Award**), Highly Cited Researchers (**HiCi**), papers indexed in Science Citation Index-Expanded

and Social Science Citation Index (**PUB**), the percentage of papers published in the top 20% journals of each subject (**TOP**). Detailed indicators and weights for each subject are provided in Table 1.

Table 1. Indicators and weights for ARWU-SUBJECT

	Weight	Mathematics	Physics	Chemistry	Computer Science	Economics/ Business
Alumni	10%	Alumni of an institution winning Fields Medals in Mathematics since 1961	Alumni of an institution winning Nobel Prizes in Physics since 1961	Alumni of an institution winning Nobel Prizes in Chemistry since 1961	Alumni of an institution winning Turing Awards in Computer Science since 1961	Alumni of an institution winning Nobel Prizes in Economics since 1961
Award	15%	Staff of an institution winning Fields Medals in Mathematics since 1971	Staff of an institution winning Nobel Prizes in Physics since 1971	Staff of an institution winning Nobel Prizes in Chemistry since 1971	Staff of an institution winning Turing Awards in Computer Science since 1971	Staff of an institution winning Turing Awards in Computer Science since 1971
HiCi	25%	Highly cited researchers in Mathematics category.	Highly cited researchers in Physics and Space Science category.	Highly cited researchers in Chemistry category	Highly cited researchers in Computer Science category	Highly cited researchers in Economics/ Business Category
PUB	25%	Papers Indexed in Science Citation Index-Expanded in Mathematics	Papers Indexed in Science Citation Index- Expanded in Physics	Papers Indexed in Science Citation Index- Expanded in Chemistry	Papers Indexed in Science Citation Index- Expanded in Computer Science	Papers Indexed in Social Science Citation Index in Economics/ Business
TOP	25%	Percentage of papers published in top 20% journals of Mathematics to that in all Mathematics journals	Percentage of papers published in top 20% journals of Physics to that in all Physics journals	Percentage of papers published in top 20% journals of Chemistry to that in all Chemistry journals	Percentage of papers published in top 20% journals of Computer Science to that in all Computer Science journals	Percentage of papers published in top 20% journals of Economics/ Business to that in all Economics/ Business journals

For each indicator, the highest scoring institution is assigned a score of 100, and other institutions are calculated as a percentage of the top score. The distribution of data for each indicator is examined for any significant distorting effect and standard statistical techniques are used to adjust the indicator if necessary.

Scores for each indicator are weighted to arrive at a final overall score for an institution. The highest scoring institution is assigned a total score of 100, and other institutions are calculated as a percentage of the top total score. The scores are then placed in descending order.

2) The ARWU-SUBJECT uses third-party data only.

Only internationally comparable third-party data are used. No data is collected from individual institutions. Cleanup of data is always performed whenever necessary. Main third party data sources are provided in Table 2.

Table 2. Third-party data sources

Data	Sources
Nobel laureates	http://nobelprize.org/
Fields Medals	http://www.mathunion.org/index.php?id=prizewinners
Turing awards	http://awards.acm.org
Highly cited researchers	http://www.highlycited.com/
Papers indexed in Science Citation Index-Expanded and Social Science Citation Index	http://www.webofknowledge.com
Journal Citation Report	http://www.webofknowledge.com

QS: QS has three extensive datasets that enable us to drill down by subject area: our ACADEMIC and EMPLOYER reputation surveys, and the Scopus data we use for our CITATIONS per Faculty indicator in the global rankings. Those indicators bypass the direct involvement of institutions and can reliably be stratified by subject discipline. They have then been combined to produce our subject results.

Times: Times Higher Education has published top 100 tables in six areas: arts and humanities; social sciences; physical sciences; life sciences; engineering and technology; and clinical & health subjects

But for the first time in 2016-17 (publication September 2016) we will expand to eight broad categories. We will disaggregate business from our social sciences rankings, and we will separate computer science from engineering and technology.

So the eight new subject areas will be: arts and humanities; social sciences; business; physical sciences; life sciences; engineering; computer science; clinical & health subjects.

The THE subject rankings are unique in the world in that they deploy the most balanced and most sophisticated methodology: they use the same 13 performance indicators used to create the World University Rankings (<https://www.timeshighereducation.com/news/ranking-methodology-2016>). There is a slight re-weighting of different elements of the rankings to better reflect publication habits in different disciplines. For example, in subjects where fewer outputs come through journal articles and there is less confidence in bibliometrics as a proxy for excellence, we will give less weight to the citations analysis, and more weight to other indicators.

While other rankings organisations rank at a finer grain subject level, the indicators used are much more narrow.

U-Multirank: With its 2016 edition U-Multirank covers 13 subjects. In 2017 the scope of subjects will be broadened by including some new subjects (economics, civil engineering, chemical engineering). At the same time the subjects of the 2014 release (plus computer science) will be updated for the first time.

The general plan is to update individual subject rankings in a rolling three-year cycle. On the long run the aim is to include 25 to 30 subjects.

In line with its general approach the U-Multirank subject rankings differ fundamentally from the traditional international league tables. First, U-Multirank is multi-dimensional and does not aggregate single indicators to a composite overall score. The decision about the relevance of indicators is left to the users. There are neither theoretical nor empirical reasons to assign a particular weight to a particular indicator. Second, U-Multirank does not calculate a league table. In order to avoid false impressions of exactness of data and of the degree of difference between institutions (“number 23 is better than number 26”), institutions are ranked into five rank groups on each indicator. A detailed description of the methodology can be found on the [UMR website](#).

In order to present a multi-perspective ranking U-Multirank uses data from various data sources: data based on institutional surveys (both on the institutional and the subject level, data from the largest student survey in the world (up to now 103,00 students responded and provided their view on their learning experience), data from bibliometric databases and – in relevant subjects – data from international patent databases.

U-Multirank deploys the most sophisticated set of indicators of all international subject rankings. Depending on the subjects, 30-35 indicators are measuring performance in five dimensions: teaching and learning, research, knowledge transfer, international orientation and regional engagement. The [U-Multirank Indicator Book](#) provides a detailed definition and description of all indicators.

Question3: How does your organization determine the types of subjects it ranks and the number of institutions in a specific subject area?

U.S. News: U.S. News works with our data provider Thomson Reuters to help determine the types of subjects and the number of institutions that are ranked in a specific subject area. The U.S. Best Global subject rankings are powered by Thomson Reuters InCites research analytics solutions. The bibliometric indicators are based on data from the Web of Science. The 22 subject fields used in the analysis came from subject schema in Thomson Reuters' InCites, which uses the content and citation indicators from the Web of Science.

The first step in producing the subject rankings was to create the total universe of schools that could be ranked in each field. Depending on the subject, the top 250 or 500 universities that had published the most papers in that subject area in the 2009-2013 time period were included in the ranking universe. This year, U.S. News studied how many papers each university had published in each of the 22 subject areas and determined that the rankings could be extended in some areas, as many universities had published more than 250 papers in that subject, or more than 500 papers, in the 2009-2013 period.

Working with Thomson Reuters' bibliometric experts, it was determined that fields such as engineering, chemistry and physics had enough papers to significantly expand the number of schools ranked in that subject compared with last year. This meant that the total number of schools ranked in each subject and the number of ranked universities published by U.S. News vary depending on the total number of papers published in that subject in the five-year period. Unlike last year, when each subject ranking featured the top 100 universities, in this year's edition, the number of universities ranked in each field varies. In eight fields, the top 250 universities are ranked; in five fields, the top 150 are ranked; and in nine fields, the top 100 are ranked.

For a more detailed description of the scope and coverage in each field, please see the notes provided on [InCites™](#).

ARWU: There are two types of subject rankings. First one is to rank the academic units such as colleges, schools, departments or programs. It is more difficult to collect the data and often done by organizations with some power. Another one is to rank the academic fields, which is easy to implement and doable for researchers or media. Considering the internationally comparability of subjects and availability of data, we chose three ones in natural sciences (mathematics, physics, chemistry), one in engineering (computer sciences) and one in social sciences (economics/business) as the first parts to be ranked.

Every institution that has any Nobel Laureates, Fields Medals, Highly-Cited Researchers or major universities of every country with significant amount of papers indexed by Science Citation Index-Expanded and Social Science Citation Index is included. So, more than 2000 universities around the world are scanned annually and around 1200 are ranked. The results of the best 200 are published for ARWU-SUBJECT rankings.

QS: There are innumerable subject disciplines and sub disciplines. Through analysis of academic survey results over a protracted period and publication data from Scopus, QS Intelligence Unit has identified 52 subject areas which may, at some stage in the next few years, reach the necessary data levels to facilitate a ranking. They have been selected due to their meeting all of the following criteria:

Inclusion of specialists: QS has ensured that surveys have included all key specialist institutions operating within the discipline, regardless of whether they may have been expected to feature in the overall QS World University Rankings®

Academic response level: Subject attracts sufficient academic responses:

Overall appropriateness of indicators: Indicators and approach prove appropriate and effective in highlighting excellence in the discipline.

Institution Prerequisites. In order to feature in any discipline table, an institution must meet three simple prerequisites:

Exceed the minimum required score for the academic and/or employer reputation indicators

Exceed the five-year threshold for number of papers published in the given discipline

Offer undergraduate or taught postgraduate programs in the given discipline

Times: The World University Rankings, while examining the full range of a university's core missions, including the teaching environment, give most weight to teaching excellence. The single biggest performance indicator is based on citation analysis (Scopus' Field Weighted Citation Impact). In order to secure statistical rigour in the citation analysis, we only include in the world university rankings institutions which have published at least 200 papers a year in journals indexed by Elsevier's Scopus, over a five year period (so a minimum of 1,000 papers). We work with Elsevier to determine our global population of eligible universities. Once the universities are identified, THE works in cooperation with each institution to collect basic institutional data, in a secure data portal: student and faculty numbers,

income figures etc. We only rank those institutions which have actively submitted and signed off all their institutional data. Last year this amounted to 1,128 universities.

The six broad subject areas were determined in 2009 for the 2010 rankings, based on subject mappings agreed with our ten data partners, Thomson Reuters.

U-Multirank: The subjects are selected in consultation with the UMR Advisory Board. The plan is to include subjects with highest number of students while at the same time covering major broad subject areas (like engineering, sciences, social sciences,...).

UMR includes institutions awarding Bachelor degrees (or equivalent, according to ISCED 6 level) as the lowest degree. The number of institutions per subject are depending on the number of institutions registering for participation per subject. In addition U-Multirank includes (in subjects with appropriate bibliometric data) the top 100 research universities, based on the absolute publication output in the subject. Depending on the subjects the actual number of institutions varies between some 150 to more than 400 in large fields (as e.g. business studies)

Question4: Please explain in what ways people may find your subject rankings more useful than your overall university ranking. (comparison with overall ranking)

U.S. News: U.S. News Best Global Universities Subject Rankings

The subject rankings are important since they can be used to determine which schools are the leaders in key academic subject areas. In many cases, an institution that had a strong focus on a certain subject was ranked in that subject but was excluded from the overall Best Global Universities rankings encompassing the top 750 universities worldwide. In total, 45 universities and one country, Georgia, were in the subject rankings but not the overall top 750 rankings.

Today, more students are exploring higher education options beyond their own borders. Universities worldwide are competing for the best students, renowned faculty and research dollars. Aware of these trends, the major research universities in the U.S. have been competing internationally for many years; in fact, the American higher education model of research institutions is being copied by many other countries. The Best Global Universities subject rankings can help put these global trends in context. U.S. News has also published these rankings to give prospective students the tools to accurately compare universities globally, regionally and within their own country, as well as by field of study. Ranking indicators were specifically chosen to enable cross-border comparisons of higher education institutions. While these rankings focus on academic research and reputation, prospective students looking for the right school for them can confidently assume that a ranked university has many highly respected faculty members – those who have been successfully publishing in top peer-reviewed journals that have determined that their work reflects solid scholarship and has advanced the state of knowledge in a discipline.

These subject-specific rankings – which are not of academic majors, departments or specific schools at universities, such as business schools or medical schools – are based on academic research performance in those subjects. We have used various bibliometric measures, including publications and citations, as well as indicators for global and regional reputation in that specific subject.

ARWU: Comparing with the overall ranking, the ARWU-SUBJECT rankings could be more useful. (1) The subject rankings often makes more sense for specialized institutions. (2) An institution consists of a

number of subject fields, whose quality may differ greatly from one to another, but overall ranking obscures these differences. (3) They are often more reliable with regards to the reputation, publication and citation. (4) They are more helpful for university administrators.

QS: Many prospective international students know first WHAT they want to study before asking the question of WHERE they want to study. Also, universities are diverse entities and have varying strength in different subjects. This Rankings examine the institutional strength of universities in specific subject fields. In this sense, QS WUR by subject serves as a very useful tool to enable prospective students to make a more informed choice on the place to study for the subject they are interested in.

Times: The overall THE World University Rankings have become a trusted source of comparative performance information to governments, university leaders, industry leaders, faculty and students across the world. They provide a strong geopolitical indicator for governments and policy makers (for example they are built into Japan's economic growth plans, and also into several national higher education Excellence Initiatives). They provide powerful, transparent key performance indicators for university leaders, helping them to set and shape strategy (for example the rankings data is used in our various data benchmarking products, helping universities to understand their relative performance across 13 areas). They offer students and their families a strong, simple idea about the overall reputation and global standing of universities, to help inform their study choices. Indeed, a study by Hobsons found that one in three international students use the THE World University Rankings as part of their decision-making process.

However, THE is committed to providing more fine-grain data, breaking down composite scores, offering rankings in context (for example by region, or institutional characteristics) and by subject. This allows a wider range of stakeholders to use the data in a wider range of ways. For example, a student using rankings may want reassurance that the institution they are planning to invest their future in has a good international standing overall, but they are naturally more likely to want to examine the university's performance in the subject that they want to study. Overall rankings can disguise excellence at the subject level, or mask poorer performance in key areas if others perform very well.

U-Multirank: While the institutional ranking may be most relevant and interesting for university leaders and policy makers, subject rankings present information on the level which is most relevant for students' decision making about a university. Though a number of student may look for a university performing well across subjects, most students are interested in information about the particular subject they want to study. It does not help them to see that a university performs quite well as an institution /on average when the very subject they want to study is performing poor. The relevant level of information hence are the actual units (faculties, departments) which are offering degree programmes in a field rather than a vague definition of a subject at a university. In order to further increase the benefit of U-Multirank for student users UMR provides a number of information and indicators even on individual degree programmes.

Question5: In what ways is the institutional research office involved in subject ranking data collection?

U.S. News: U.S. News Best Global Universities Subject Rankings

The U.S. News Best Global Universities Subject Rankings does not use any school level statistical data (see ranking indicator table in table #2) that a school's IR office reports as part of any data collection. So, IR offices are not part of any statistical data used by U.S. News in its Best Global subject rankings.

It should be noted that it possible that some IR offices respond to or are involved with the Thomson Reuters' Academic Reputation Survey (http://ip-science.thomsonreuters.com/m/pdfs/GIPP_AcamRep_report.pdf). Results from the Thomson Reuters' Academic Reputation Survey were used to create the two reputation indicators used in our ranking analysis. The survey, which aimed to create a comprehensive snapshot of academics' opinions about world universities, had respondents 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.

ARWU: The ARWU-SUBJECT rankings use internationally comparable third-party data since its first publication. To keep its consistency, there will no change of methodology in future.

QS: The subject rankings are compiled utilizing the results of our two reputation surveys and bibliometric data taken from Scopus. The Institutional research office can help to identify academics and employers who are most closely associated with the institution, who have a sound knowledge about the quality of graduates from universities or about the excellence of research in a given faculty area at a certain institution. Also the office can get involved in helping us to most accurately match our database against Scopus and to rectify discrepancies (internally and externally) should any arise.

Times: Times Higher Education is unique among all ranking organisations in that it sees its rankings as a full, cooperative partnership with all the universities involved. All institutions in the rankings provide data to THE via its secure data portal, and sign the data off. We are very proud of this collaborative arrangement, where the institutions see the benefits of taking part in the process. We provide basic benchmarking data back to the institutions who take part, for free. Our team of dedicated data editors are on hand to work (often in multiple languages) with any institutional research office on any technical questions they have about the data collection process, data definitions, subject mapping, etc and we are always happy to expand our database to new institutions.

U-Multirank: U-Multirank data collection involves a continuous, collaborative cooperation with universities. U-Multirank is implementing a network of institutional data coordinators who play an active role in the quality assurance process of UMR. The data collection process via the secure data portal includes several feedback loops with universities to guarantee a high data quality. As universities are organised in different ways in different higher education systems, there is no uniform representation in the group of institutional coordinators. In a number of institutions data collection directly involves and is coordinated by institutional research offices. Yet in many universities other centralised units (e.g. presidents' offices, controlling units) or the faculties /faculty administration is involved in data collection.

Question6: What is a typical data collection and ranking release timeline for your subject ranking?

U.S. News: The U.S. Best Global subject rankings are powered by Thomson Reuters InCites research analytics solutions. The bibliometric indicators are based on data from the Web of Science. U.S. News. U.S. News uses Thomson Reuters' Academic Reputation Survey which is a fundamental component of the Thomson Reuters Global Institutional Profiles Project and the data collected in the survey forms contributes a profile of each of the world's leading higher education institutions. The survey was designed with the help of many experts in the field and aims to be the most comprehensive snapshot of academics' opinion of the world's universities.

The Profiles Project combines the results of the survey with other data collected by Thomson Reuters to create key indicators for the diverse activities of academic institutions. The Profiles Project is also the data source for the US News Best Global Universities Ranking. For more information see: (<http://ip-science.thomsonreuters.com/globalprofilesproject/>)

The data collection takes place in the winter and spring. The most recent US News Best Global Universities Ranking were published on October 5, 2015. The 2016 timing next US News Best Global Universities Ranking will be similar to 2015's timing.

ARWU: The ARWU-SUBJECT rankings are updated annually and published on every August 15th. All data for the ARWU-SUBJECT are collected by us from January to May.

QS: Subject rankings are usually published within the first quarter of every year. Due to the early publication date during a year, the dataset used for subject rankings is the same period as the previous year's WUR.

Times: The institutional data collection is carried out once a year, between January and the end of March each year. If any institution has not submitted data yet, or wants to be included in future rounds, please email Profilerankings@timeshighereducation.com. The subject rankings are released alongside or shortly after the publication of the annual World University Rankings, usually in late September/early October each year.

U-Multirank: UMR applies the most thorough data collection procedure to guarantee highest quality of data. There is an annual cycle of data collection. After registration (in spring) data collection is generally running from June to December, including institutional and subject data collection, the organisation of a student survey in cooperation with participating universities, and bibliometric and patent data analysis. This phase already includes two feedback loops with universities on their data and a first verification of data by the UMR data team. After the final verification of data (which still includes direct communication with universities) indicator scores and rank groups are calculated.

Institutional data can be updated by universities annually. In a rolling system subject rankings are updated in a three-year cycle with a number of subjects updated in one year (e.g. for the 2017 release the engineering subjects which have been included first in 2014 will be updated. With regard to the burden of data delivery to universities and the fact that the performance of universities and faculties does not change dramatically within one year UMR does not see any benefit in annual updates of

ranking results. Looking at other ranking we see that big shifts in results from one year to another in most cases are the result of changes in methodology or methodological artefacts.

Both institutional and subject rankings are published in spring. The latest publication was on 5th April 2016.

Question7: Please provide your recommendations of how universities may use your subject ranking. Please be specific and feel free to use examples and case studies.

U.S. News: The subject rankings are important since they can be used to determine which schools are the leaders in key academic subject areas. In many cases, an institution that had a strong focus on a certain subject was ranked in that subject but was excluded from the overall Best Global Universities rankings encompassing the top 750 universities worldwide. Of course the subject rankings are very important to specific departments at a school since they can compare themselves globally. Specific departments in subject areas that are being ranked are likely to have far greater interest in the subject rankings than in the overall rankings. Below are two examples of how the U.S. Best Global Universities subject rankings can be used in analysis to show which countries are strongest in subject and which schools are strongest in subjects. Basically subject ranking can used to show strength and weakness of subject areas of schools against their peers.

2016 Best Global: Japan, China, South Korea, Hong Kong Performance in the 22 Subjects

Schools ranked most times in the 22 subjects.

University	# of Subject Rankings
Harvard University	22
University of British Columbia	22
University of California--Davis	22
University of Minnesota--Twin Cities	22
University of Wisconsin--Madison	22
Columbia University	21
Cornell University	21
McGill University	21
Ohio State University	21
Rutgers State University	21
Stanford University	21
University College London	21
University of California--Berkeley	21
University of California--Los Angeles	21
University of California--San Diego	21
University of Cambridge	21
University of Michigan	21
University of Oxford	21
University of Toronto	21
University of Washington	21
Imperial College London	20
KU Leuven	20

University of Florida	20
University of Melbourne	20
University of Sydney	20

Subject	Japan-% of institutions represented	China-% of institutions represented	South Korea-% of institutions represented	Hong Kong-% of institutions represented	USA-% of institutions represented
Agricultural Sciences	2.0%	7.0%	1.0%	0.0%	26.0%
Arts & Humanities	0.0%	0.0%	0.0%	1.0%	46.0%
Biology & Biochemistry	3.6%	4.0%	2.0%	0.4%	36.4%
Chemistry	4.0%	12.0%	3.2%	2.0%	24.4%
Clinical Medicine	4.0%	1.6%	1.6%	0.8%	32.0%
Computer Science	1.0%	14.0%	3.0%	5.0%	36.0%
Economics & Business	0.0%	1.0%	1.0%	5.0%	45.0%
Engineering	2.4%	14.8%	3.2%	2.0%	21.2%
Environmental & Ecology	1.3%	4.7%	0.7%	0.7%	34.0%
Geosciences	4.0%	5.3%	0.0%	0.7%	33.3%
Immunology	3.0%	0.0%	0.0%	0.0%	43.0%
Material Sciences	4.0%	16.0%	5.6%	2.0%	23.2%
Mathematics	1.3%	15.3%	1.3%	2.7%	28.7%
Microbiology	4.0%	0.0%	1.0%	1.0%	44.0%
Molecular Biology & Genetics	3.3%	2.7%	0.0%	0.7%	36.7%
Neuroscience & Behavior	2.0%	1.3%	0.7%	0.0%	40.0%
Pharmacology & Toxicology	3.0%	9.0%	2.0%	2.0%	31.0%
Physics	4.4%	3.6%	3.6%	0.0%	29.6%
Plant & Animal Science	3.6%	4.0%	0.4%	0.4%	24.4%
Psychology/Psychiatry	0.0%	0.0%	0.0%	1.3%	47.3%
Social Sciences and Public Health	0.8%	1.6%	0.4%	1.6%	39.2%
Space Science	6.0%	1.0%	0.0%	0.0%	41.0%

ARWU: The most important feature of ARWU-SUBJECT rankings is that their methodology are globally sound and transparent, so that one can compare the performance of particular universities or countries throughout the years. Their value have been widely recognized, universities may make reference to ARWU-SUBJECT rankings for various purpose.

(1) Universities may use the ARWU-SUBJECT rankings to benchmark themselves with their peers and to set goals in their strategic plans. To improve the global positions, they need to know where they are and how to do better, and global university rankings are helpful for them in thinking and answering these questions. University leaders know well about their own institutions, with global rankings, they can form more rational views on their global standings. In addition, global rankings mark universities with different global status, which allow university leaders to easily select a number of target universities to do more comprehensive and detailed analysis, and the findings may help them to think what should be done in the future.

(2) University leaders may use the ARWU-SUBJECT rankings to identify their relative strengths and weaknesses more specifically, which is often helpful to universities' strategic planning. Global rankings not only generate ranks, but provide globally comparable data on universities. For instance, ARWU-SUBJECT shows that in recent years top Chinese universities have realized a rapid growth in total number of papers indexed by Thomson Citation Databases and some of them have already been ranked among world top 50 on this metric, however their number of publications in prestigious journal Nature and Science have been almost unchanged, implying they still lack very creative studies. This information could help leaders of top Chinese universities to realize that in the future, special attention should be paid to encourage original research and breakthrough innovation.

(3) Although global rankings have many limitations, if there have been no change in their methodologies, university leaders may compare the performance of their own universities in different years, which helps monitoring their quality changes through time. The ultimate goal for any university should not be a higher rank, but the quality. University leaders should be careful about making those decisions that could lead to the rise of ranking positions but may have negative impact on institutions' quality.

(4) Universities may take the ARWU-SUBJECT rankings as effective tools in building and maintaining reputation, which are important to attract talent and resources and to gain support of general public. About 1/4 media in major countries reported ARWU rankings in 2015, and hundreds of universities cite them in their reports.

(5) One of the features of internationalized higher education is varied forms of collaboration among universities in different countries. Universities may use the ARWU-SUBJECT rankings as the reference to recruit the academic staff and students, choose partners in other countries or allocate the sponsorship for overseas study of students.

QS: If the institution wants to promote its results they can now download official badges for the subjects in which the institution is eligible. Other aspects that may have value:

- Increased attractiveness to higher value faculty
- Easier to attract and establish high value, brand-building partnerships
- Potential bonus pay outs for admin and planning staff
- Easier to attract industrial funding
- May be a factor in putting an argument for increased government funding
- Higher potential

Like our World and Regional Rankings, the Subject Rankings also provide easily readable information and are therefore beginning to be used as a basis for funding allocations, as well as for developing national or regional higher education policies.

Times: We put the broad subject data in the public domain and anyone can use it as they see fit. Each of the top 100 universities in a subject ranking or any THE ranking is profiled on our website. The profiles break down the composite scores into five areas of assessment: teaching environment; citations; research (reputation, income, volume); international outlook; innovation (industry income)

Since late 2015, THE has been providing a data-driven performance benchmarking service.

THEDataPoints are a suite of data products designed to help universities improve through performance

analysis and benchmarking. Data is provided across 13 indicators at the institutional level and the subject level, and users can select a number of comparator institutions. The benchmarking tools can help university decision making, for example in terms of highlighting areas which may need investment for improvements.

In addition, universities across the world regularly use their success in the THE's subject rankings for publicity and marketing purposes (see, for example: <http://news.mit.edu/2015/mit-named-best-university-worldwide-social-sciences-1109>)

U-Multirank: One of the major aims of UMR is to provide information and data which can be used by universities for benchmarking. UMR covers a broad range of institutional profiles ("types" of universities). UMR developed a unique tool, based on empirical data, which allows universities to compare/benchmark to institutions with a similar profile (like-with-like approach). A recent study by the European University Association (EUA) among their member universities showed that U-Multirank deploys presents exactly those indicators which are most relevant for the strategy management within universities.

U-Multirank is actually used by universities and university associations for benchmarking purposes. For example, UMR has a strategic partnerships with CESAER (Conference of European Schools for Advanced Engineering Educating and Research), an association of leading European technical universities (incl. e.g. Zurich, Lausanne, Delft, Munich, Aachen). CESAER implemented a UMR task force which is using UMR results and data for benchmarking among their member universities regularly.

In addition, UMR may be used by institutions to identify potential partners for cooperation. By using the UMR mapping/profile tool they can find institutions which are similar on a number of profile indicators of their own choice.

Question 8: What strategies can universities use to maintain or improve their subject rankings?

U.S. News: Most of the subject rankings being done by all the major ranking organizations involve the use of publications and citations. As a result Universities who are interested in subject rankings should become aware of what Thomson Reuters and Elsevier are doing in terms of how their own school's publications are being counted. Are they being counted correctly? Are their school naming and faculty authorship issues –these sometimes prevent all publications and citations at a school from being counted fully and accurately. Becoming an expert or at least very knowledgeable in how bibliometric is done can be very helpful, too.

ARWU: Please refer to the answers for Question 7.

QS: Technically – universities can be more strategic on selecting the contacts of academics and employers – e.g. a good balance between domestic and international, throughout different subject areas. Also, in some cases some papers and citations remain unidentified as those from the university. The university could contact Scopus to rectify these technical issues which could make a difference in subject rankings results.

More fundamentally – genuine efforts to be better recognized by academics and employers e.g. research collaborations, more practical training for students to increase their employability, and proactive research both in quantitative and qualitative ways.

Times: The THE rankings are robust, rigorous and transparent, and the comprehensive and balanced nature of the group of 13 indicators mean that there is no simple way to improve a ranking position. Improving true performance should be the only way to move up the rankings. The methodology was developed over almost a year of open consultation during 2009 to closely match institutions' strategic priorities. So improving in area like research influence and academic reputation are key. Attracting more research income from industry, and from research grants and contracts will help, as will drawing in international talent (both students and staff) and improving faculty-student ratios, for example.

U-Multirank: First of all, universities in UMR *cannot* improve their ranking by influencing reputation surveys. UMR is the only ranking which is fully based on performance indicators and not on reputation. As U-Multirank is the only ranking which does not apply weights to single indicators (to calculate the composite) it does not set incentives to focus on indicators with highest weights. According to their own profile and strategy universities themselves should set their own priorities for improving their performance and quality. Success in those strategies, e.g. in intensifying research cooperation with industry, will be reflected in the UMR indicators measuring those aspects (research income from industry, co-publications with industrial partners, co-patents with industry).

Question 9: Since 2015, have there been any new changes or developments, or proposals for change from your ranking in general? (Both overall ranking and subject ranking, or other types of rankings you have)? If so, please specify.

U.S. News: U.S. News is always thinking about how improve our rankings and that is the case for our Best Global Universities rankings. At this point in time, however, we have nothing specific to announce. However, at a minimum there will be changes made for the 2016 rankings in both the overall and subject rankings.

ARWU: As the first multi-indicator ranking of global universities, ARWU has been providing reliable and scientific performance comparison of universities in the world for the past 12 years. We will update ARWU, ARWU-FIELD and ARWU-SUBJECT as before in 2016.

More importantly, we have been exploring the possibilities to rank more globally comparable and 'important' subjects such as agriculture, material science, etc. In 2016, there will be new subject rankings to be published. They will use our latest research results for example introducing more international scientific awards, and more internationally renowned scholars. For the purpose of solving the field imbalance in the statistics of international academic awards, we selected a list of around 80 international academic awards and classified them according to their academic prestige and degree of internationality.

QS: Also, much like last year's QS World University Rankings, we have applied an affiliation cap, discarding any paper with more than a given number of affiliations. However, in response to robust feedback on a flat cap of 10, we have here applied a variable cap at the first whole number above 99.9% of all research in the given field, reducing the proportion of excluded papers from 0.34% last September, to less than 0.1% going forward.

Times: Times Higher Education World University Rankings went through the biggest transformation of its 13 year history during 2015. Although the changes were largely behind the scenes, they were profound. For the first time, instead of depending on third party data sources for all rankings data

(Thomson Reuters), THE brought data collection and data analysis in-house. This came about following a major investment in data.

All institutional data collection (which last year involved more than 1,100 institutions providing many thousands of data points) is now managed by THE staff and THE now also owns and manages all the data drawn from the annual academic reputation survey (around 400,000 data points). Bibliometric data is now sourced from Elsevier's Scopus database.

The changes mean that not only can THE be much more accountable for the rankings, it can be much more responsive to sector needs – providing richer, deeper data insights and products, as well as developing innovative new performance metrics to capture a wider range of university activity.

Plans for the future include much greater subject-level detail, much more regional and national analysis, and moves into new areas of performance, particularly teaching and learning.

U-Multirank: In line with the IREG Berlin Principles on Rankings U-Multirank is keeping its basic methodology stable while fine-tuning some details of methods and data definitions at the same time. One example: In calculating student-staff-ratio UMR managed to provide a more valid indicator by referring only to academic staff which is involved in teaching (i.e. by excluding staff exclusively involved in research). In order to improve data quality further UMR implemented a set of more than 30 automated consistency and plausibility checks directly into the institutional and subject questionnaires. In 2016 lists of the 25 top performers in selected indicator have been published for the first time. Those lists showed the diversity in higher education as quite different institutions score highest in different indicators and the showed the appropriateness of the multi-dimensional approach.