MosIUR
THE THREE UNIVERSITY MISSIONS

The Three University Missions Moscow Ranking Methodology 2019

The first draft of the Moscow International University Ranking methodology has been developed as a result of a wide public discussion with a total of over 100 collective contributors: universities, rector councils, expert associations, and rating agencies. The list of ranking criteria was submitted for consideration to the International Expert Council of Ranking comprised of 25 renowned tertiary education experts representing the USA, the UK, Brazil, China, India, South Africa, Iran, Italy, Belgium, Turkey, Poland, and Russia.

Expert discussions were continued after the pilot ranking had been released in December 2017. In 2018 some of the indicators were corrected as the result of the feedback, while the list of participating universities was extended to 500, and further to 1700 in 2019. The study results underwent international assessment. Preliminary results of university ranking by country were sent to the experts for review and commentary.

Shortlisted Universities

The shortlist of the Moscow International University Ranking in 2019 aimed to provide the widest possible representation of the leading multi-profile universities all over the world so that the number of the universities representing a particular country correlated with the importance of the country in terms of global economy. More than 1700 universities that achieved leading positions in global university rankings and/or national academic rankings listed in IREG Inventory of National Rankings were included in the evaluation list in 2019. In some cases the selection was carried out on the basis of number of the university's academic papers from 2014 to 2017 indexed in Web of Science Core Collection citation database, as per the data from the analytics tool InCites. Furthermore, narrow-focused higher education institutions, i.e. those without educational programmes in at least two of 6 areas of knowledge according to the OECD classification, and higher education institutions with no undergraduate programmes were excluded from consideration.

Changes in the Indicators

The 2018 and 2019 rankings were based on the same set of evaluation criteria, but some of the weights of indicators were changed in the 2019 issue. The weights of the University Website Reach and Total Pages of a University's Website Indexed by the Leading Search Engines indicators were raised, both from 3% to 4%. At the same time, the indicators, which were found overrated as a result of feedback from universities, were weighted down: the weights of University Graduates Who Have a Separate Page Dedicated to Them on Wikipedia, from 9% to 8%, and Online Courses of the University Published on the Largest Global Online Platforms lost weight, from 6% to 5%.

Information Sources

The ranking uses only objective criteria approved by the international experts. Reputation surveys are entirely excluded from consideration. The ranking is based on the open data available at the official websites of universities as well as data from independent global sources: Clarivate Analytics, data and metrics provider from InCites and Global Institutional Profiles Project (GIPP); Elsevier, owner of the bibliographic and abstract database Scopus; online platforms for mass education Coursera and edX; the universal multilingual Internet encyclopedia Wikipedia; search engines (Google, Yandex, Baidu); social networks (Facebook, Twitter, VK, Sina Weibo); the Alexa company; web portals of international student academic contests; websites of the academic awards from the IREG List of International Academic Awards.

Ranking Calculation

The overall weight of indicators per group is: 45% for Education, 25% for Research, and 30% for University and Society.

The university score reflecting its position relative to the competitors was calculated by each indicator. The calculation was conducted in two ways:

1. For the normalised indicators (citation impact and scientific publication views), the score of the participating universities was calculated according to the formula:

$$x_i = \frac{a_i - a_{min}}{(a_{max} - a_{min})},$$

where:
x_i is the score of the i^{th} indicator;
a_i is the value of the i^{th} indicator;
a_{max} is the maximum value of the i^{th} indicator;
a_{min} is the minimum value of the i^{th} indicator.

2. In cases where linear calculation was hardly applicable, indicator normalisation was used instead.

The university scores for each ranking indicator were then multiplied by the corresponding weight coefficients. The weighted university scores in each of the indicators were then summarised:

$$f = \sum_{i=1}^{n_x} x_i \ v_i,$$

where:
f is the ranking score;
x_i is the score of the i^{th} indicator;
n_x is the number of ranking indicators;
v_i is the weight of the i^{th} indicator.

International Assessment of Preliminary Ranking Results

International experts were actively involved in verification of the results. Each expert received preliminary ranking results for his or her country.

16 international experts provided their commentary in 2019 — recognised academics from their country's top universities, university ranking compilers, higher education researchers, and education quality assessment experts. The experts reviewed a total of 691 university entries and their ranks out of 1200 (57.6% of the list initially planned for publication).

The experts reviewed 16 countries and territories: Austria, Brazil, China, Germany, Hong Kong, Hungary, Iran, Italy, Macau, Mexico, Poland, Russia, Turkey, the United Arab Emirates, the United Kingdom, and the United States. We considered all the critical remarks of the experts, reviewed the original data for each controversy, and made corresponding corrections where there were sufficient grounds.

Moreover, as a result of consultations with the international experts we removed 15 organisations from the original list for publication: higher education institutions that had merged with another university; medical centers within a comprehensive university; research institutions that do not offer higher education programmes; small universities with less than 500 students.

Moscow International University Ranking "The Three University Missions" Indicators 2019

№	Name	Parameters measured	Weight, %	Meaning and justification	Data source	Details
I. Group of indicators: Education						
1	Wins in international student contests by students	Student competitiveness	7	Unlike common scientometric indicators, which measure achievements of university staff, the innovative criterion of the Moscow Ranking makes it possible to measure competitiveness of university students. The criterion demonstrates the amount of knowledge, skills and competence university students obtain, as well as their ability to use these resources to solve complex tasks. The number of winners of international student olympiads and other prestigious international contests cannot be big, but nevertheless, the number of prizewinners of prestigious contests can show in a focused way the effectiveness of education and aptitude of the university students for breakthrough scientific research.	Websites of international contests	Personal and team wins in the 15 international student contests* from 2014 to 2018 were calculated in a similar way as Olympic 'medal standings' (absolute winners and prizewinners were considered). Each contest was given a weight depending on the number of countries covered *(ACM ICPC, which brings together students from over 100 countries, has the maximum weight, 1.00; while NSUCRYPTO and Belgrade Business International Case Competition with participants from as few as 9 countries have a weight of 0.09).* The weighted values were then summed.
2	Proportion of international students in the total number of students	Attractiveness for international students	8	This indicator demonstrates the proportion of international students in the total number of students and is widely used by existing academic rankings.	University and regulatory body websites	International intramural students of all programmes that lead to a degree of bachelor, master, PhD, and their equivalents, who spent more than 3 months in the university in the particular year *(the ratio is calculated to the total number of intramural students of all programmes that lead to a degree of bachelor, master, PhD or equivalent ISCED-2011 Levels 6-8 degrees).*
3	University budget to student ratio	Financial resources	15	This criterion evaluates a university's financial wellbeing. The higher the indicator, the wider the range of the university's opportunities to implement the three main missions: education, scientific research, and contribution to society.	University and regulatory body websites	Due to the fact that the cost of products and services may vary significantly from country to country, the budget was converted into PPP defined by World Bank (or the OECD PPP in case the necessary value was not present). Students of all on campus programmes that lead to a degree of bachelor, master, PhD, and their ISCED-2011 Levels 6-8 equivalents were considered.
4	Student to academic staff ratio	Human resources	15	The indicator actually demonstrates the sufficiency of the university's human resources. More faculty and research staff per student means more attention that university staff can afford to pay to each student, and, as a result, better conditions in the university.	University and regulatory body websites	The academic staff value, which includes faculty staff and research staff, was calculated in full time equivalent. For the number of students, intramural students of all programmes that lead to a degree of Bachelor, Master, PhD, and equivalent ISCED-2011 Levels 6-8 degrees were considered.

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II. Group of indicators: Research						
5	IREG List awards won by university academic staff and alumni	Outstanding scientific achievements	6	This metric has been the developed from the approach proposed by the Shanghai ranking. Calculating the number of laureates of prestigious prizes to evaluate the scientific potential of the university is fundamentally correct. However, considering the Nobel Prizes and the Fields Medal significantly limits university evaluation opportunities. Therefore, we used the IREG List of International Academic Awards, which includes the world's 99 most prestigious scientific awards (providing the opportunity to prolong the prize list later).	Websites of international awards	Awards from the IREG List of International Academic Awards a university's staff and alumni won during the period from 1999 to 2018. Only permanent university staff members as of the date of prize giving were considered. Alumni included those who successfully completed a programme that leads to a degree of Bachelor, Master, PhD, and equivalent degrees.
6	Field-Weighted Citation Impact (global level), according to Scopus	Quality of scientific publications (international level)	5	The normalised citation impact quantitatively shows how much better or worse than world average a particular publication is cited compared with publications of the same type, area of knowledge, and year. The indicator demonstrates global relevance of the university's research activities within the academia, reflecting its acuteness and quality. Normalised citation indicators are widely used by academic rankings.	Scopus	The pool of papers covers a period of four years. The normalised citation impact is calculated separately for 6 broad areas of knowledge according to OECD classification: *Natural Sciences, Engineering and Technology, Medical Sciences, Agricultural Sciences, Social Sciences, and Humanities.* The scores gained in each area of knowledge were then summed.
7	Normalised Citation Impact (global level), according to Web of Science	Quality of scientific publications (international level)	5	The normalised citation impact quantitatively shows how much better or worse than world average a particular publication is cited compared with publications of the same type, area of knowledge, and year. The indicator demonstrates global relevance of the university's research activities within the academia, reflecting its acuteness and quality. Normalised citation indicators are widely used by academic rankings.	Web of Science	The pool of papers covers a period of four years. The normalised citation impact is calculated separately for 6 broad areas of knowledge according to OECD classification: *Natural Sciences, Engineering and Technology, Medical Sciences, Agricultural Sciences, Social Sciences, and Humanities.* The scores gained in each area of knowledge were then summed.
8	Field-Weighted Citation Impact (national level), according to Scopus	Quality of scientific publications (national level)	1	The indicator demonstrates global relevance of the university's research activities within the academia of the university's home country. Introducing this criterion contributes to better consideration of achievements of national science schools and more accurate measurements in humanities.	Scopus	The pool of papers covers a period of four years. This indicator is different from indicator 6 is different in the fact that for each of the six areas of knowledge a ratio of a university's normalised citation impact to its country's respective value is calculated. The relation of the university's result to the best result among the universities located in this particular country was used as the final value.
9	Normalised Citation Impact (national level), according to Web of Science	Quality of scientific publications (national level)	1	The indicator demonstrates global relevance of the university's research activities within the academia of the university's home country. Introducing this criterion contributes to better consideration of achievements of national science schools and more accurate measurements in humanities.	Web of Science	The pool of papers covers a period of four years. This indicator is different from indicator 7 is different in the fact that for each of the six areas of knowledge a ratio of a university's normalised citation impact to its country's respective value is calculated. The relation of the university's result to the best result among the universities located in this particular country was used as the final value.

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10	Research income per academic staff member	Staff involvement in research and development	5	The indicator actually shows the amount of R&D finance per staff member. The higher the amount of finance per staff member, the more relevant is the university's research. For those universities which collect the expense data instead of income, the indicator is calculated as expenses (budget) per academic staff member.	University and regulatory body websites	The funds a university attracted for academic research and development were considered. This sum does not include other components, such as income from education activities, investment, commercialisation, etc. In case country-specific features or other peculiarities do not allow to calculate the research income, research budget as fund spent on research are used. The indicator was calculated using PPP defined by World Bank (or the OECD PPP in case the necessary value was not present). The academic staff value, which includes faculty staff and research staff, was calculated in full time equivalent.
11	Field-Weighted Views Impact (according to Scopus)	Relevance of scientific publications	2	The indicator evaluates how relevant a university's scientific publications are for wide audience of the Scopus citation database. The necessity for this indicator is that it shows the popularity of a paper amongst users, including those whose work output cannot be evaluated through citation impact values: students, journalists, analysts, science communicators and writers, researchers, whose papers are not included in Scopus, and others interested in modern science.	Scopus	The indicator was calculated as an average Field-Weighted Views Impact (FWVI) of all of the considered papers of a university published during the four year period. Like Field-Weighted Citation Impact, this indicator is calculated by comparing each publication with those of the same type, area of knowledge, and year.
III. Group of indicators: University & Society						
12	University's online courses published on the biggest global online platforms	University's contribution to affordable online education	5	This innovative indicator has never been used in global academic rankings before MosIUR. It measures the university's activity in the area of massive open online courses. There is a clear public demand for open online courses, and the fact that this education activity is rapidly developing is beyond doubt. The more courses published on global on-line platforms, the wider is the knowledge transferred by the university via the internet, and the more significant a university's contribution to education affordability worldwide is.	Online platforms: Coursera & edX	Total number of online courses published on the global online platforms Coursera and edX and available for users as of the data compilation moment (March 2019).
13	University's share in its country's total academic publications	University's contribution to the country's scientific research	4	This innovative ranking criterion measures national significance of universities for scientific development in their respective countries. The higher the university's proportion in the country's total university publications, the bigger is its contribution to research in the country, and consequently, the more important and valuable such a university is for society.	Web of Science	The ratio of a university's scholarly output measured by the total number of academic papers published during the four year period indexed by the Web of Science Core Collection database to its home country's scholarly output.

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14	Total pages of a university's website indexed by the leading search engines	Web presence	4	This indicator reflects a number of important aspects of a university's communication with society: openness, transparency, information accessibility, and university's commitment to information exchange.	Search engines: Google, Baidu, Yandex	The number of web pages of a university's official domain indexed by search engines was measured by standard domain search syntactical operators of the following search engines: Google, Baidu, Yandex. The minimum index value according to each engine was determined after a series of data retrievals in April 2019. The highest result of the three search engines was used as the final value.
15	Views of the university's page on Wikipedia	Web popularity	1	Along with the official website a university's page on Wikipedia is an important source of information. A high number of views of the university's page show the university's societal impact.	Wikipedia	Total views of the university's Wikipedia pages in English and (if applicable) in the official national language (languages) in 2017.
16	University's followers in social media	Social network communication	4	Social media is one of the most practical communication tools for the university and those interested in its activity. A significant number of universities create awareness of their activity through social media. Different social networks are popular in different countries and for different universities. Therefore, data of subscribers in 4 social networks was compiled for each university.	Facebook, Twitter, VK, Sina Weibo	The number of the university page subscribers was analyzed in 4 social networks: Facebook, VK, Twitter, Sina Weibo. The pages available in English and the national language (if applicable) were considered. The total number of subscribers in the two social networks in which the university's audience is the largest, i. e. in the social networks which have the highest priority for the university communication-wise, was used as the final value.
17	Number of the university's graduates with an individual article on Wikipedia	Alumni impact on society	8	High-quality education consists to a large extent of incommensurate phenomena, among other things it can be measured by university's impact on society. One of the most effective ways to measure it is to count the number of alumni successful in various areas (politics, science, art, business, charity) with an individual article on Wikipedia about them. The indicator quantitatively evaluates the university's impact on society.	Wikipedia	Total number of university alumni with an individual page on Wikipedia meeting the threshold values: alumnus date of birth: not earlier than 1948; page views: at least 1000 in 12 months before the time of data compilation (July 2017 to June 2018). Thus, the pages which are not often visited by the users are excluded from calculation.
18	University website reach	Societal relevance	4	This indicator reflects the relevance of the official university website for users throughout the world. The higher the ratio of the Internet users visiting the university website, the more popular the university is. If the university website is visited by a large number of Internet users, the university is considered relevant and valuable for society.	Alexa	This criterion evaluates the university website audience percentage among all Internet users. This evaluation is based on data collected from Alexa (alexa.com), one of the global leaders in web analytics. The data were compiled in April 2019.

* *list of student contests:*

- *ACM International Collegiate Programming Contest*
- *Belgrade Business International Case Competition*
- *Green Brain of the Year Contest*
- *International Mathematics Competition for University Students*
- *John Molson Undergraduate Case Competition*
- *McGill Management International Case Competition*
- *Network of International Business Schools Worldwide Case & Business Plan Competitions*
- *NSUCRYPTO*
- *SCORE Software Engineering Contest*
- *The Annual Willem C. Vis International Commercial Arbitration Moot*
- *The Mathematical Contest in Modeling*
- *The Philip C. Jessup International Law Moot Court Competition*
- *The SIAM Award in the Mathematical Contest in Modeling*
- *The University Physics Competition*
- *The World Universities Debating Championships*