

A Universidade do Porto no The Academic Ranking of World Universities (ARWU) Shanghai Ranking 2019

Universidade do Porto. Reitoria.
Gabinete de Estudos Estratégicos e Melhoria Contínua
3 de setembro de 2019

Sumário

1. Metodologia do ARWU - Shanghai ranking	2
2. Evolução das posições da U.Porto no ARWU – Shanghai ranking	5
3. Universidades portuguesas no ARWU Shanghai ranking 2019	7

A Universidade do Porto no The Academic Ranking of World Universities (ARWU) – Shanghai Ranking 2019

<http://www.shanghairanking.com/index.html>

1. Metodologia do ARWU - Shanghai ranking

“The Academic Ranking of World Universities (ARWU) was first published in June 2003 by the Center for World-Class Universities (CWCU), Graduate School of Education (formerly the Institute of Higher Education) of Shanghai Jiao Tong University, China, and updated on an annual basis. Since 2009 the Academic Ranking of World Universities (ARWU) has been published and copyrighted by ShanghaiRanking Consultancy. ShanghaiRanking Consultancy is a fully independent organization on higher education intelligence and not legally subordinated to any universities or government agencies.

ARWU uses six objective indicators to rank world universities, including the number of alumni and staff winning Nobel Prizes and Fields Medals, number of highly cited researchers selected by Clarivate Analytics, number of articles published in journals of Nature and Science, number of articles indexed in Science Citation Index - Expanded and Social Sciences Citation Index, and per capita performance of a university. More than 1800 universities are actually ranked by ARWU every year and the best 1000 are published.

Although the initial purpose of ARWU was to find the global standing of top Chinese universities, it has attracted a great deal of attention from universities, governments and public media worldwide. ARWU has been reported by mainstream media in almost all major countries. Hundreds of universities cited the ranking results in their campus news, annual reports or promotional brochures. A survey on higher education published by The Economist in 2005 commented ARWU as “the most widely used annual ranking of the world’s research universities”. Burton Bollag, a reporter at Chronicle of Higher Education wrote that ARWU “is considered the most influential international ranking”.

One of the factors for the significant influence of ARWU is that its methodology is scientifically sound, stable and transparent. The EU Research Headlines reported ARWU work on 31st December 2003: “The universities were carefully evaluated using several indicators of research performance.” Chancellor of Oxford University, Chris Patten, said “it looks like a pretty good stab at a fair comparison.” Professor Simon Marginson of Institute of Education, University of London commented that one of the strengths of “the academically rigorous and globally inclusive Jiao Tong approach” is “constantly tuning its rankings and invites open collaboration in that”.

ARWU and its content have been widely cited and employed as a starting point for identifying national strengths and weaknesses as well as facilitating reform and setting new initiatives. Bill Destler, the President of the Rochester Institute of Technology, drew reference to ARWU to analyze the comparative advantages that the Western Europe and US have in terms of intellectual talent and creativity in his publication in the journal Nature. Martin Enserink referred to ARWU and argued in his paper published in Science that “France’s poor showing in the Shanghai ranking ... helped trigger a national debate about higher education that resulted in a new law... giving universities more freedom”.¹

“Candidate Universities

ARWU considers every university that has any Nobel Laureates, Fields Medalists, Highly Cited Researchers, or papers published in *Nature* or *Science*. In addition, universities with significant amount of papers indexed by Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI) are also included. In total, more than 1800 universities are actually ranked and the best 1000 are published.

Ranking Criteria and Weights

Universities are ranked by several indicators of academic or research performance, including alumni and staff winning Nobel Prizes and Fields Medals, highly cited researchers, papers published in Nature and Science, papers indexed in major citation indices, and the per capita academic performance of an institution. 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; standard statistical techniques are used to adjust the indicator if necessary. Scores for each indicator are weighted as shown below to arrive at a final overall score for an institution. The highest scoring institution is

¹ <http://www.shanghairanking.com/aboutarwu.html> acedido 02/09/2019.

assigned a score of 100, and other institutions are calculated as a percentage of the top score. An institution's rank reflects the number of institutions that sit above it.

Indicators and Weights for ARWU

Criteria	Indicator	Code	Weight
Quality of Education	Alumni of an institution winning Nobel Prizes and Fields Medals	Alumni	10%
Quality of Faculty	Staff of an institution winning Nobel Prizes and Fields Medals	Award	20%
	Highly cited researchers	HiCi	20%
Research Output	Papers published in <i>Nature</i> and <i>Science</i> *	N&S	20%
	Papers indexed in Science Citation Index-expanded and Social Science Citation Index	PUB	20%
Per Capita Performance	Per capita academic performance of an institution	PCP	10%
Total			100%

* For institutions specialized in humanities and social sciences such as London School of Economics, N&S is not considered, and the weight of N&S is relocated to other indicators.

Definition of Indicators

Indicator	Definition
Alumni	The total number of the alumni of an institution winning Nobel Prizes and Fields Medals. Alumni are defined as those who obtain bachelor's, master's or doctoral degrees from the institution. Different weights are set according to the periods of obtaining degrees. The weight is 100% for alumni obtaining degrees after 2011, 90% for alumni obtaining degrees in 2001-2010, 80% for alumni obtaining degrees in 1991-2000, and so on, and finally 10% for alumni obtaining degrees in 1921-1930. If a person obtains more than one degrees from an institution, the institution is considered once only.
Award	The total number of the staff of an institution winning Nobel Prizes in Physics, Chemistry, Medicine and Economics and Fields Medal in Mathematics. Staff is defined as those who work at an institution at the time of winning the prize. Different weights are set according to the periods of winning the prizes. The weight is 100% for winners after 2011, 90% for winners in 2001-2010, 80% for winners in 1991-2000, 70% for winners in 1981-1990, and so on, and finally 10% for winners in 1921-1930. If a winner is affiliated with more than one institution, each institution is assigned the reciprocal of the number of institutions. For Nobel prizes, if a prize is shared by more than one person, weights are set for winners according to their proportion of the prize.
HiCi	The number of Highly Cited Researchers selected by Clarivate Analytics. The Highly Cited Researchers list issued in December 2018 (2018 HCR List as of December 6, 2018) was used for the calculation of HiCi indicator in ARWU 2019. Only the primary affiliations of Highly Cited Researchers are considered.
N&S	The number of papers published in <i>Nature</i> and <i>Science</i> between 2014 and 2018. To distinguish the order of author affiliation, a weight of 100% is assigned for corresponding author affiliation, 50% for first author affiliation (second author affiliation if the first author affiliation is the same as corresponding author affiliation), 25% for the next author affiliation, and 10% for other author affiliations. When there are more than one corresponding author addresses, we consider the first corresponding author address as the corresponding author address and consider other corresponding author addresses as first author address, second author address etc. following the order of the author addresses. Only publications of 'Article' type is considered.
PUB	Total number of papers indexed in Science Citation Index-Expanded and Social Science Citation Index in 2018. Only publications of 'Article' type is considered. When calculating the total number of papers of an institution, a special weight of two was introduced for papers indexed in Social Science Citation Index.
PCP	The weighted scores of the above five indicators divided by the number of full-time equivalent academic staff. If the number of academic staff for institutions of a country cannot be obtained, the weighted scores of the above five indicators is used. For ARWU 2019, the numbers of full-time equivalent academic staff are obtained for institutions in USA, UK, France, Canada, Japan, Italy, China, Australia, Netherlands, Sweden, Switzerland, Belgium, South Korea, Czech, Slovenia, New Zealand etc.

Data Sources

Nobel Prize: <http://nobelprize.org/>

Fields Medals: <http://www.mathunion.org/>

HiCi: <https://clarivate.com/hcr/>

N&S: <http://www.webofscience.com/>

PUB: <http://www.webofscience.com/>

Others: Number of academic staff data is obtained from national agencies such as National Ministry of Education, National Bureau of Statistics, National Association of Universities and Colleges, National Rector's Conference." ²

Apesar de a informação não ser usada na elaboração do Shanghai Ranking, desde 2011, a Universidade do Porto responde ao inquérito Global Research University Profiles (GRUP) do The Center for World-Class Universities (CWCU) of Shanghai Jiao Tong University, atualmente do ShanghaiRanking Consultancy.

² <http://www.shanghairanking.com/ARWU-Methodology-2019.html> acedido 02/09/2019

2. Evolução³ das posições da U.Porto no ARWU – Shanghai ranking

Posições da Universidade do Porto no ARWU Shanghai ranking

	Ranking Mundial	Ranking Europeu	Ranking Ibero-americano	Ranking Nacional
2007	403-510	173-208		1**
2008	402-503	169-210	13*	1**
2009	402-501	171-208	13*	1**
2010	401-500	169-204	15	1**
2011	301-400	124-164	9	1
2012	301-400	124-158	8	1
2013	301-400	127-164	8-17	1-2
2014	301-400	122-160	9-17***	2
2015	301-400	123-158	10-17****	2
2016	301-400	122-158	8-18 (v)	2
2017	301-400	123-157	8-15 (vi)	2
2018	301-400	121-157	9-16 (vii)	2
2019	301-400	118-157	10-15 (viii)	2

* A par com a PUC do Chile, a Universidade do Chile, a UNESP, a UFRGS, a Universidade de Granada, a Universidade de Lisboa, a Universidade de Sevilha e a Universidade de Saragoça.

** A par com a Universidade de Lisboa

*** A par com Complutense University of Madrid, Federal University of Minas Gerais, Federal University of Rio de Janeiro, Polytechnic University of Valencia, UNESP, University of Campinas, University of Granada e University of Pompeu Fabra.

**** A par com Federal University of Rio de Janeiro, Polytechnic University of Valencia, UNESP, University of Campinas, University of Granada e University of Valencia.

(v) A par com Autonomous University of Barcelona, Complutense University of Madrid, Federal University of Minas Gerais, Federal University of Rio de Janeiro, Polytechnic University of Catalonia, Polytechnic University of Valencia, Pompeu Fabra University, UNESP, University of Chile, University of Santiago Compostela.

(vi) A par com Autonomous University of Barcelona, Autonomous University of Madrid, Complutense University of Madrid, Federal University of Rio de Janeiro, UNESP, University of Chile, University of Santiago Compostela.

(vii) A par com Autonomous University of Barcelona, Autonomous University of Madrid, Federal University of Rio de Janeiro, UNESP, University of Campinas, University of Chile e University of the Basque Country.

(viii) A par com Autonomous University of Madrid, Federal University of Rio de Janeiro, Pompeu Fabra University, UNESP e University of Campinas.

³ Dados de 2007 a 2013 retirados de “Evolução das posições da Universidade do Porto nos rankings universitários”, janeiro de 2014, in https://sigarra.up.pt/up/pt/conteudos_service.conteudos_cont?pct_id=20113&pv_cod=55GoHdmanvlg; dados de 2014, 2015, 2016, 2017, 2018 e 2019 retirados de <http://www.shanghairanking.com/> respetivamente em 03/11/2014, 15/08/2015, 15/08/2016, 16/08/2017, 05/09/2018 e 02/09/2019.

Scores da Universidade do Porto no ARWU Shanghai ranking

	Total Score	Alumni	Award	HiCi	N&S	PUB	PCP
2014	n/d	0	0	0	9,4	42,7	20,3
2015	n/d	0	0	0	10,7	42,2	21,1
2016	n/d	0	0	0	11,8	43,2	22,1
2017	n/d	0	0	0	11,3	44,6	22,9
2018	n/d	0	0	0	11,8	44,6	18,9
2019	n/d	0	0	0	11,7	45,1	18,7

n/d - O Total Score só é apresentado para as 100 primeiras universidades.

3. Universidades portuguesas no ARWU Shanghai ranking 2019

Posições das Universidades portuguesas no ARWU Shanghai ranking 2019

	Ranking Mundial					Ranking Europeu					Ranking Ibero-americano					Ranking Nacional				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
University of Lisbon	201-300	151-200	151-200	151-200	151-200	81-122	56-82	58-82	58-80	57-79	4-9	2-5	1-2	1-3	2-3	1	1	1	1	1
University of Porto	301-400	301-400	301-400	301-400	301-400	123-158	122-158	123-157	121-157	118-157	10-17	8-18	8-15	9-16	10-15	2	2	2	2	2
New University of Lisbon	n/c	n/c	Cand. 501-600	Cand. 501-600	401-500	n/c	n/c	>198	>195	158-193	n/c	n/c	>26	>24	16-26	n/c	n/c	6	5-6	3-4
University of Minho	n/c	401-500	401-500	401-500	401-500	n/c	159-204	158-198	158-195	158-193	n/c	19-26	16-26	17-24	16-26	n/c	3-5	3-5	3-4	3-4
University of Coimbra	401-500	401-500	401-500	Cand. 501-600	501-600	159-205	159-204	158-198	>195	194-235	18-26	19-26	16-26	>24	27-34	3	3-5	3-5	5-6	5
University of Aveiro	n/c	401-500	401-500	401-500	601-700	n/c	159-204	158-198	158-195	236-271	n/c	19-26	16-26	17-24	35-43	n/c	3-5	3-5	3-4	6
Nº de IES	500	500	500	500	1000	205	204	198	195	372	26	26	26	24	80	3	5	5	4	6

n/c – Não consta na lista desse ano.

Cand. – Instituições que não constavam no top 500 (em 2017 e 2018), mas estavam listadas no lote das universidades candidatas ao ranking.

Scores das Universidades portuguesas no ARWU Shanghai ranking 2019

	Total Score	Alumni		Award		HiCi		N&S		PUB		PCP	
	2018/ 2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
University of Lisbon	n/d	0	0	8,0	8,0	9,6	14,7	12,5	13,0	50,1	51,3	26	26,9
University of Porto	n/d	0	0	0	0	0	0	11,8	11,7	44,6	45,1	18,9	18,7
New University of Lisbon	n/d	0	0	0	0	0	7,3	8	9,9	28,9	30,0	16,5	17,6
University of Minho	n/d	0	0	0	0	9,6	14,7	3,5	6,1	30	30,8	16,6	17,8
University of Coimbra	n/d	0	0	0	0	0	0	7,1	6,2	34,4	34,5	17,3	17,0
University of Aveiro	n/d	0	0	0	0	9,6	0	3,6	2,5	30,8	31,2	21,7	20,6

n/d - O Total Score só é apresentado para as 100 primeiras universidades.