

Questions Regarding University Selection: What Methods Can Be Used to Measure a University's Reputation

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Introduction

Selecting a university is an incredibly complex and long process in part because it can have a significant impact on the opportunities any given individual is presented with in his life for decades to come. Since it is vitally important for each university to offer study opportunities to the most qualified applicants, we think it is useful go deeper into this topic.

One of our prior studies partially addressed the question of how students select a university. What we observed is that despite the fact that the studied research data originated from various parts of the world and from various times, research seemed to indicate that the reputation of the higher education institution was always one of the top aspects. We are specifically interested in the topic because unlike with other factors that can easily be quantified (geographical distance in kilometers, chance of acceptance in percent), measuring the reputation of a given university is not that easy.

We began our research by studying the literature related to the topic of university selection. We were interested in how the reputation of a university ranks among the selection preferences.

In the following part of our research, we were looking to find the factors we could use to measure the reputation of a given university. Whether it is possible to establish a hierarchy among these factors. We will give an introduction to one of the most famous international rankings that explicitly deals with the measurement of the reputation of universities: the "Times Higher Education - World Reputation Rankings" - distinct rankings about the reputation of higher education institutions published since 2011 by Times Higher Education in association with one of the biggest academic publishers, Elsevier. We will likewise cover three international higher education rankings (QS World University Rankings compiled by Quacquarelli Symonds, Academic Ranking of World Universities by Shanghai Ranking and the World University Rankings by Times Higher Education) that include the most important quantitative indicators used to evaluate universities and a description of these indicators. We will then systematize these indicators and establish an order between them based on their respective weights.

Literature

In the beginning of our effort to map the relevant literature, we sought to define the concept of a university's reputation:

[..] „*Reputation of an organization refers to public perceptions of the organization shared by its multiple constituents over time.*”¹

Then, we were aiming to answer two different questions. We were interested to find out what kind of motivational factors influence the students' university selection and the rank of the reputation of a given institution in the framework of these results. Our second objective was to learn what methods were used to assess the preferences of students in the selection of a university. We wanted to learn how the individual indicators were mapped. The literature we studied has shown that the indicators tend to appear in quite a similar order and is not strongly impacted by the country or time of the survey.¹

Sally Bakera and Brian Brown published the results of their Great-Britain study in 2007 in their article titled “Prestige and reflections in the university choice process”. In an effort to study the role of tradition and reputation, they conducted in-depth interviews with 13 students. Perhaps one of their most interesting interview subjects was Sarah, a student at Oxford University. She answered the question of why she choose this university by describing a childhood experience:

„*Sarah remembered a teacher saying at a parents' evening that: ... 'she should easily be able to go to university, she could even go to Oxford' ... it just germinated ... I anted to sort of show off and I wanted to show that I could go to the best university*
... ”²

We specifically value this study because it points out that the value of a university's reputation can show its impact even in the most simplistic of situations. There is no room to study such details in large-scale surveys. Could it be that if the teacher had mentioned another university in the conversation and not Oxford, Sarah would not have applied to Oxford? By exact methods, we cannot even start to quantify how much a university's reputation contributes to the chance of it being selected. An article by Zsuzsa M. Császár and Júlia Radvánszky-Németh lists similar conclusions. While studying the university selection performed by students, they found that courses in more prestigious fields that offer a better career play an important role in university selection.³

¹ - E.g., the reputation of the university was among the first three factors in every case, while the opinion of friends and parents always had its place at the end of the preference list.

There was an international study of the motivations of applicants to Vietnam National University, Hanoi – International School. This 2005 study is interesting because, although in less detail, but they were working with a sample of 174 and the study provided a good opportunity for them to rank the various indicators based on their occurrence.⁴ The analysis of the results shows reputation in the first place in university selection and at the same time, the decisions of friends is ranked among the least important factors.

We also wanted to introduce a larger-scale survey. In Hungary, the Education Authority had a survey to measure the most important aspects considered in the process of university selection among students. They had a total of 4676 respondents whose responses form the basis of the following priority list:

1. reputation – 2435 people (52.1%),
2. quality of education – 749 people (16%),
3. proximity to place of residence – 581 people (12.4%),
4. high school achievements – 341 people (7.3%),
5. other – 270 people (5.8%),
6. community life at the institution – 184 people (3.9%),⁵

In Romania, the topic was studied by Emanuela Maria Avram, but with a different approach. She studied the occurrence of the individual factors in the various literatures. She established that the reputation of the university, the opinion of parents, scholarships and university location belong among the most frequently mentioned aspects.⁶

A Czech study was performed to study the decision-making mechanism: the process up until the student selects the university where he/she will study. The author was not only concerned with the degree individual factors (career, reputation) influence the university selection itself, but also studied the relationship of these variables to each other.⁷ In the sample, the author separated those who applied for studies in the field of economics from those who applied for studies in a technical field. He concluded that while in the case of students who applied for studies in a technical field, their chosen field influenced their decision the most, the decision of the students applying for studies in the field of economics was to the greatest part influenced by their future career.

We thus observe that, according to most studies, the reputation of the university plays a very important role in the selection of a higher education institution. In the following part of our paper, we would like to address what components the reputation of a university has and whether the big international rankings take this factor into consideration in the process of compiling their lists at all.

Factors that determine the reputation of a university in international rankings

We have seen the number of organizations participating in compiling university rankings increase worldwide at an extraordinary rate. This is not surprising because selecting a university is an incredibly complex and long process and one of the key issues in creating a ranking is the objective of its creation.⁸

The most straightforward objective of compiling rankings is to help define the position of given universities relative to other higher education institutions.

„Increasing market-based orientation and international character of higher education institutions around the globe have led students, universities and governments to take a great interest in knowing the position that a particular centre, university or other higher education entity have in comparison with other entities. With the massification of universities practically in every continent, the initiatives to obtain independent analysis of the quality of universities have increased rapidly in recent years across many nations.”⁹

It was our goal to list the factors that can affect the reputation of a university. We have found an article titled “Comparative study of international academic rankings of universities“ in the journal “*Scientometrics*” very helpful to our research.¹⁰ This article includes an itemized list of criteria that can affect the reputation of a given higher education institution. The paper is an extraordinarily good summary that lists 28 indicators in total, but was written in 2006 and also includes a higher education ranking that is no longer compiled. We found it important to compile a similar comparative table containing the indicators we considered in the process of evaluating the reputation of higher education institutions.

Methods

One of the biggest challenges we faced was to determine which higher education rankings to include in compiling our own list. We defined five criteria which we then considered during the selection of lists to include.

1. **Internationality:** we have considered only rankings that assess the achievements of universities comprehensively on a worldwide scale
2. **Methodology:** one of the most important aspects of selection was the free availability of the methodology of the ranking. We only considered higher education rankings with a transparent methodology.
3. **Definition:** Webster’s definition regarding university rankings is also referred to in the publications related to higher education rankings of Buena-Casal¹¹ and Clarke¹².

Webster mentioned two main components:

- a) It must be arranged according to some criterion or set of criteria which the compiler(s) of the list believed measured or reflected academic quality.
 - b) It must be a list of the best colleges, universities, or departments in a field of study, in numerical order according to their supposed quality, with each school or department having its own individual rank, not just lumped together with other schools into a handful of quality classes, groups, or levels.¹³
4. Experience: we wished to exclude recently established lists, therefore we only considered organizations that have been compiling their rankings for more than ten years now.
 5. Regularity: one of our emphasized prerequisites was that the list be published annually so we could base our study on the most recent data.

We have come to the decision to include three international higher education rankings that were also frequently referred to in the literature we had studied. QS World University Rankings compiled by Quacquarelli Symonds, the Academic Ranking of World Universities by Shanghai Ranking and the list World University Rankings by Times Higher Education were selected for the purposes of the comparison.

It was seen as important to compile a summary table of each individual factor included in at least one of the rankings. Our table contains how many times a given factor is included in the international rankings, in the descending order of their respective weights.

First, we assessed the indicators comprising the Academic Ranking of World Universities (ARWU)¹⁴, released by Shanghai Ranking Consultancy *indikátorait vizsgáljuk meg. 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 ncluded.*¹⁵

The following factors are considered during the compilation of the list (weights are in parentheses)

Alumni (10%): Total number of the Nobel Prize and Fields Medal winner alumni of an institution.

Award (20%): Total number of the Nobel Prize in Physics, Chemistry, Medicine and Economics and Fields Medal in Mathematics winner staff of an institution.

Highly Cited Researchers (20%): The number of Highly Cited Researchers chosen by Clarivate Analytics.

Nature and Science (20%): The total number of Nature and Science paper publications between 2013 and 2017.

Publications (20%): Number of 'Article' type paper publications of 2017 which have gotten indexed in Science Citation Index-Expanded and Social Science Citation Index.

PCP (10%): The weighted scores of the above five indicators divided by the number of full-time equivalent academic staff.

The next list was QS World University Rankings¹⁶ compiled by Quacquarelli Symonds. Five indicators are brought into consideration in the process of compiling this ranking:

Academic reputation (40%): The expert opinions of over 80,000 individuals in the higher education space regarding teaching and research quality at the world's universities are collated into an academic academic survey.

Employer reputation (10%): The QS Employer Survey gathers over 40,000 responses from employers to identify those institutions from which they source the most competent, innovative and effective graduates.

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.

Citations per faculty (20%): To calculate it, we the total number of citations received by all papers produced by an institution across a five-year period by the number of faculty members at that institution.

International faculty ratio/International student ratio (10%): 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.

In our search for indicators, the third list we selected was the Times Higher Education World University Rankings¹⁷ that takes into account a total of 13 indicators in five broader categories.¹⁸

Reputation survey (15%): we will write about this list later in our work.

Staff-to-student ratio (4.5%) Doctorate-to-bachelor's ratio (2.25%) Doctorates-awarded-to-academic-staff ratio (6%)

Institutional income (2.25%): Institutional income is scaled against academic staff numbers and normalised for purchasing-power parity (PPP).

Reputation survey (18%): 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 above).

Research income (6%): Research income is scaled against academic staff numbers and adjusted for purchasing-power parity (PPP).

Research productivity (6%): To measure productivity we count the number of publications published in the academic journals indexed by Elsevier’s Scopus database per scholar

Citations (30%): they examine research influence by capturing the average number of times a university’s published work is cited by scholars globally.

Proportion of international students (2.5%) Proportion of international staff (2.5%)

International collaboration (2.5%): The number of a university’s total research journal publications having at least one international co-author.

Industry income (2.5%): This metric captures knowledge-transfer activity by measuring the research income an institution earns from industry (adjusted for PPP), proportionally by the number of academic staff the institution employs.

We have put the identical factors in the same row. The table also includes a cumulative percentage column with the aggregates percentages. We are also giving an average value which was the basis of the descending order in which we sorted the individual factors in the table 1.

Table 1: The summary table of factors considered in the process of evaluating Universities

Nr.	Factor	Academic Ranking of World Universities	QS World University Rankings	Times Higher Education - World University rankings	Cumulative percentage	Average percentage
1	Academic reputation survey		40%	15% + 18%	73%	24,3
2	Citations	20%	20%	30%	70%	23,3
3	Faculty/Student ratio Staff/Student ratio		20%	4.5%	24.5%	8,2
4	Nature and Science publications	20%			20%	6,7
5	Staff Nobel and Fields medal	20%			20%	6,7
6	Publications	20%			20%	6,7
7	Employer reputation		10%		10%	3,3
8	Alumni Nobel and Fields medal	10%			10%	3,3
9	indicators divided by the number of academic staff	10%			10%	3,3
10	International student ratio		5%	2.5%	7.5%	2,5
11	Doctorates awarded to academic staff			6%	6%	2

12	Research income			6%	6%	2
13	Research productivity			6%	6%	2
14	International faculty ratio		5%		5%	1,7
15	Institutional income			2.25%	2.25%	0,8
16	Proportion of international staff			2.5%	2.5%	0,8
17	International collaboration			2.5%	2.5%	0,8
18	Industry income			2.5%	2.5%	0,8
19	Doctorate to bachelor's ratio			2.25%	2.25%	0,8
	Overall percentage:	100%	100%	100%	300%	100%

Source: our own compilation

The research methodology they are using is perfect to achieve the goal. The questionnaire titled “The Academic Reputation Survey” is compiled annually. In 2018, it had a total of 10,162 scientist respondents from 138 countries of the world. There were efforts to achieve representativeness across countries and across fields of science. Where this was not possible, they assigned weights to the responses.

The reputation table ranks institutions according to an overall measure of their esteem that combines data on their reputation for research and teaching. In the survey, scholars are asked to name at most 15 universities that they believe are the best in each category (research and teaching), based on their own experience.²⁴ We can see that the reputation of universities is being measured using an extraordinarily simple method. They do not take into consideration various indicators. Instead, they simply ask the academic community, which institution they regard as the best, and compile a list based on these answers. As we can see, the institution that was mentioned the most times has a score of 100 points. The others had their scores calculated as its percentage rate.

Table 2: Top ranked universities on the list of World Reputation Rankings

Rank	Name	Research	Teaching	Overall
1	Harvard University	100	100	100
	United States			
2	Massachusetts Institute of Technology	92,9	81	89,4
	United States			
3	Stanford University	83,7	73,4	80,7
	United States			
4	University of Cambridge	71,2	72,1	71,5
	United Kingdom			
5	University of Oxford	70,1	73,8	71,2
	United Kingdom			

6	University of California, Berkeley	63,1	53,8	60,5
	United States			
7	Princeton University	38,9	37,2	38,4
	United States			
8	Yale University	33,9	33,5	33,8
	United States			
9	University of California, Los Angeles	27,2	22,9	26
	United States			
9	University of Chicago	27,5	22,2	26
	United States			

Source: Times Higher Education: World Reputation Rankings 2018²⁵

Huge disparities among the first 10 places (in a list of 100) are obvious at first glance. For example, eight of the first ten are situated in the United States of America. In addition, the score of the 9th placed is only 26% of that of the first. Therefore, there are huge differences in the opinions on the reputation of universities.

Conclusion

While studying the literature, we observed that despite that we have come upon studies conducted using various methods (the research methods included the in-depth interview, large-scale survey, literary summary and simple questionnaire), the reputation of the university was among the most important aspects of selecting a higher education institution every time.

We gave an introduction to one of the most famous international rankings that is specifically used to measure the reputation of universities, the list “Times Higher Education - World Reputation Rankings” that is compiled since 2011. We would like to highlight that the 9th on the list had a score that is 26 percent of that of the 1st. How this is possible, is detailed in the chapter discussing the methodology of this ranking.

Furthermore, we have studied three international higher education rankings (QS World University Rankings compiled by Quacquarelli Symonds, Academic Ranking of World Universities by Shanghai Ranking and the World University Rankings by Times Higher Education) that include the most important quantitative indicators used to evaluate universities and a description of these indicators. We then systematized these indicators and establish an order between them based on their respective weights. After a weight-based analysis of the individual indicators, the analysis of the methodology suggests that the biggest role – corresponding to nearly one quarter of the total achievable points – belongs to the reputation of the universities. It is taken into consideration in two of

the three rankings we included in our study. We thus observe that even the big international rankings cannot be compiled independently from the university reputation.

During our study, we encountered numerous publications that address the motivational factors influencing university selection. In our opinion, it would be useful to compile a complete summary of the results of these studies using a defined set of criteria in the future.

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