more challenges globally. Publication counts often stress established refereed journals included in such databases as those of the Institute for Scientific Information (ISI). These are mainly journals published in English and selected with the norms of the major academic systems of the United States and Britain in mind. While English is increasingly the language of science, it is not necessarily the central medium of communication in the humanities, law, and a number of other fields. Using international recognition such as Nobel Prizes as a proxy for excellence downplays the social sciences and humanities, fields in which Nobels are not awarded, and causes further disadvantages for developing countries and smaller universities around the world. Using citation counts as a way of measuring excellence also presents serious problems. Such counts emphasize material in English and journals that are readily available in the larger academic systems. It is well known, for example, that American scientists mainly cite other Americans and tend to ignore scholarship from other countries. This may artificially boost the ranking of US universities. The fact is that essentially all of the measures used to assess quality and construct rankings enhance the stature of the large universities in the major English-speaking centers of science and scholarship and especially the United States and the United Kingdom. It is also the case that universities with medical schools and strength in the hard sciences generally have a significant advantage because these fields generate more external funding, and researchers in them publish more articles.

If rankings are problematical nationally, they present even more challenges globally.

Conclusion

Rankings and league tables play a useful role. They focus attention on key aspects of academic achievement and may influence policymakers who might otherwise be content to slash budgets and maintain mediocrity. Everyone wants to be "number one," and countries want to have top-ranking universities. They may stimulate the academic community to strive to improve quality and encourage competition and productivity. Rankings are benchmarks of excellence for the public. And they help to mark differences among academic institutions and in this way help may lead to differentiated goals and missions in academic systems.

Yet, they often measure the wrong things, and they use flawed metrics to do the measurements. They privilege the already privileged and stress certain academic disciplines (mainly in the hard sciences) over others. Rankings ignore key academic roles such as teaching and do not look at all at how students are affected by their academic experience.

The solutions to these significant problems will be a difficult task. There are many conflicting interests at play in the "ranking game." Creating generally agreed criteria that can be used to do the rankings may be a useful first step. Providing appropriate ways of measuring them is also necessary. Transparency throughout the process is central—many of the current rankers are notably unclear about both criteria and methods. Applying the norms and values of the major academic "powers" will not accurately measure quality worldwide, nor will it result in meaningful international rankings. In the competitive and market-oriented academic world of the 21st century, rankings are inevitable and probably necessary. The challenge is to ensure that they provide accurate and relevant assessments, and measure the right things. ■

The Leaders of the World's Top 100 Universities

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The importance of research universities to nations' populations and economies is largely undisputed. Of equal interest are issues of university leadership and governance. Major changes have taken place in the sector through increased competition and subsequently in the role of university leaders. There has been an explosion of literature in the field of university leadership, but little information is available about the actual leaders of the world's universities, in particular the world's top research universities.

This article reports on a study that looks at the characteristics of 100 university leaders—focusing on those running top universities so as to understand the actions of successful organizations. A specific question is addressed: are top universities led by top researchers? If the best universities—which have the widest choice of candidates—systematically appoint top researchers as their presidents, this could be one form of evidence that, on average, better researchers may make better presidents.

When looking at the individuals who lead the world's top 100 universities it is possible to find both a handful of Nobel Prize winners and some leaders with few or no research citations. It might be concluded from this fact that no systematic link exists between research output and university leadership. Yet there is a strong correlation between the research background of a leader and the position of the university in a world league table.

Identifying a "Top" Research University

As higher education has become global, in the recruitment of international students and staff, so have league tables. In 2003 the first global league table of universities was produced by the Institute of Education at Jiao Tong University (SJTU) in

Shanghai, China. The league table was initially generated because the Institute of Education wanted to assess how Chinese universities compared with others around the world. (See http://ed.sjtu.edu.cn/ranking.htm.)

An advantage of the SJTU global ranking is that it is not produced by a newspaper or magazine. The table is compiled using data such as academic or research performance, the number of highly cited researchers and of prizes. While there are weaknesses in its methodology, the SJTU ranking is undoubtedly the best of a very small bunch of databases.

Universities in the World's Top 100

The 2004 edition of the SJTU global table reveals that universities in the top 100 are dominated by the United States, where 51 of the institutions are located. US universities are unevenly spread across the world's top 100. They dominate the top 20 with 17 universities, and have 30 in the top 40. Of the 100 total, only 4 in the bottom 20 are US based.

Thirty-seven institutions out of 100 are located in European countries—11 in the United Kingdom, 7 in Germany, 4 in both France and Sweden, 3 in Switzerland, 2 in the Netherlands, and 1 each in Austria, Denmark, Finland, Norway, Italy, and Russia. Finally, there are 12 universities in the rest of the world—5 in Japan, 4 in Canada, 2 in Australia, and 1 in Israel.

The higher the global ranking of a university, the more likely it is that the citations of its president will also be high.

Who Are the Leaders?

The national location of an institution is not always reflected in the nationality of its president. For example, the top 10 universities are found in two countries, the United States (8) and the United Kingdom (2); whereas the leaders come from 4, Canada, New Zealand, the United Kingdom, and the United States.

There are 15 female presidents among the 100. Of particular interest is that six of these presidents are at the world's top 20 universities, and 10 are within the top 50 group. Thus it is more common to find a female leader among the top universities than those lower down in the 100 group. Regarding their location, North America dominates with 9 female presidents in the United States and 2 in Canada. The remaining 4 are in Denmark, France, Sweden, and the United Kingdom.

Every president in the group of 100 universities has a PhD. The majority have been academics, though two presidents spent most of their careers in nonresearch positions in industry or government, and a small group went almost directly into academic administration.

It is increasingly difficult to identify the ages of presidents. Some European universities still publish date-of-birth information, though they are in the minority. Birth dates can be loosely calculated by using an individual's age at first-degree graduation. Using this method, it is possible to produce an approximate average age of the 100 presidents, which is 59 years.

It is also interesting to look at the disciplinary backgrounds of the 100 leaders. Fifty-two have come from a scientific discipline. The scientists are dominated by the life sciences, at 50 percent, but there are also 11 engineers, 6 physicists, 5 chemists, and 4 computer scientists.

Thirty-seven of the 100 presidents of the world's top universities are social scientists. The largest disciplinary group among the social scientists is that of lawyers, who number 15. Within a second group of 16 there is an even spread of educationalists, political scientists, sociologists, and those from public and social policy. Finally, there are 6 economists. Only 11 presidents are from the arts and humanities. Leaders from the arts have been declining in number since the early 1900s, when that was the dominant discipline among university leaders.

Top Researchers Lead the Top Universities

The research history of the 100 leaders—based on the number of scholarly publication citations and rated against disciplinary citation norms—reveals that there are 12 extremely highly cited presidents who are among the top 250 in their fields (see www.isihighlycited.com). (The citation information used in this study comes from Web of Science, the on-line database comprising the Science Citation Index.) Such individuals are more common at the top universities. Six are at the top 20 universities, 3 at the next 20, 2 at the next, and 1 in the fourth quartile. Finally, there are 3 Nobel Prize winners among the presidents (all in medicine)—two in the top 20 and one in the 20-to-40 category.

When the citations of each president's publications are totaled, normalized by discipline, and then correlated with the position of a university in the league table, we find an interesting pattern. The higher the global ranking of a university, the more likely it is that the citations of its president will also be high. Indeed, those leading the top 50 universities are two and a half times more highly cited than those at the bottom 50. And a president at a top 20 university has almost five times the citations of a leader in the bottom quintile. In other words, better universities appoint better researchers to lead them.

Conclusion

A simple link between the position of a univerisity and the research history of its leader does not explain causality. Further research is required. These results do, however, suggest that being a good manager and leader is enhanced in a university context if a president is a successful researcher. The core work of a university is research and research-led teaching. It may be that a leader who has inherent knowledge of the core business can make all the difference to a university's performance. ■