به نام خالق زیبایی ها

یه روز خوب نمیاد
...
خواستم یادآوری کنم
یه روز خوب رو باید ساخت

آشنایی با نظام های رتبه بندی دانشگاهی در دنیا

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استادیار کتابداری و اطلاع رسانی پزشکی

مسئول علم سنجی و سرپرست انتشارات، دبیر کمیته استعدادهای درخشان

دبیر کمیته طرح های نوآورانه آموزشی مبتنی بر شواهد، رئیس کمیته دانشجویی توسعه آموزش

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Introduction

❑ The university rankings have become very popular in recent years.

❑ They conform to different methodologies to evaluate educational and research performance.

❑ Several studies explain the shortcomings of international university rankings, such as:

- A focus on the size of the university (including the number of faculty members and academic fields);
- English language;
- Bias in the hard sciences;

- Age (of university);
  - Scope;
  - Research focus;
  - Spurious precision (these rankings overestimate slight differences in the total score);
  - Weight discrepancies;
  - Assumed mutual compensation;
  - Indicator redundancy;
  - An inter-system discrepancy;

- Negligence of indicator scores;

- An inconsistency between changes in ranking and overall scores;

- Excessive emphasis on country and university reputation

Introduction

- One study showed a relationship between a university's score in the international university rankings, its expenditure per student, and other factors, such as the university mission, size, and productive inefficiency

- Other challenges about the international university rankings are the relatively small coverage of universities, more focus on standard outputs in citation databases for some fields and languages (e.g., peer-reviewed publications and citations), lack of transparency of ranking methodology, and indefinite weightings

Introduction

- Besides global ranking systems, the national university rankings have been developed by local institutions.
- Most national rankings are not equally known as the international rankings, but they provide access to in-depth knowledge about local institutions.
- They include more comprehensive indicators that are often excluded by the international rankings due to the challenges such as data collection on a global scale.
- In contrast, the international ranking systems rely on accessible bibliometric or webometric data and reputation surveys.
- The emphasis on bibliometric indicators in the international rankings has been criticized because such indicators favor large research universities without focusing on other important missions of a university, including education and service to the public.
- Thus, the national rankings aim to provide better access to the national data sources

Introduction

- Some university rankings introduced innovation-industry indicators alongside other metrics due to the increased importance of university and industry relationships and creating income from technological and innovational actions.

- One of these university rankings is the Ranking of Innovative Universities (RIU), provided by Thomson Reuters.

- Sometimes, these rankings are overestimated in public debate as a mirror reflection of the efficiency of research and the higher education system and are used to reform university management

Introduction

- Some studies have shown that most national rankings emphasize educational indicators rather than research performance evaluation.

- Although focusing on innovational indicators besides research and educational ones will be necessary for more effective university ranking changes in technology, the application of science and research in industry, knowledge and technology transfer by collaboration between university and industry, creating income, and attracting research grants from leading industries in the world.

Introduction

- using indicators in the international university rankings means that universities in developed countries compete for high positions in these rankings as "world-class universities." In contrast, universities in developing countries may mainly build institutional competence to become research-intensive universities

- Osareh et al. compared national university ranking systems worldwide regarding their indicators. The main metrics in these rankings were education, students, financial factors, alumni, research, and faculty members. Among the main functions of universities, two factors of education and research are more salient.

- Another study compared the national and the international university rankings in terms of their indicators, coverage, and ranking results. They concluded that the national rankings include a more significant number of educational and institutional indicators, whereas the international rankings tend to have fewer indicators mainly focusing on research performance

Research performance indicators in university rankings

University ranking (last edition)	National/international (country origin, % research-oriented ranking)	indicators	Measured dimension by research indicators	Source of data collection	Time period of data collection
Academic Ranking of World Universities (ARWU)-2020	International (China-60%)	Papers published in Nature and Science-N&S (20%), Papers indexed in SCIE and SSCI-PUB (20%), Highly cited researchers-HICI (20%)	Papers, research impact	Web of science	2015-2019 (N&S articles) 2019 (HICI, PUB)
The world university rankings-2021	International (United Kingdem-62.5%)	Reputation survey (18%), research income (6%), research productivity (6%), citations (research influence-30%), international collaboration (2.5%)	Research income, outputs (papers, books), citation, international collaboration, research reputation	Scopous	2015-2020 (citation and international collaboration) 2020 (research productivity)

Research performance indicators in university rankings

QS world university rankings-2021	International (United Kingdem-20%)	Citations per faculty (20%)	Citation	Scopus	2014-2019
Performance Ranking of Scientific Papers for World Universities (NTU ranking)-2020	International (Tiwan-100%)	Research productivity (25%), Research impact (35%), research excellence (40%)	Papers, citation, research impact, research excellence	Web of Science (ESI)	2009-2019 (last 11 years, last 2 years, current years)
Webometrics ranking of world universities-2020	International (Spain-55%)	Transparency (number of citations from top 210 authors- 10%), ranking highly cited researchers in ESI, excellence or scholar (10% most cited papers- 35%)	Papers, citation, researchers, research excellence	Google Scholar profiles (citation)	2014-2018 (highly cited papers)

Research performance indicators in university rankings

University ranking (last edition)	National/international (country origin, % research-oriented ranking)	indicators	Measured dimension by research indicators	Source of data collection	Time period of data collection
CWTS Leiden ranking-2020	International (Netherlands-100%)	Scientific impact, collaboration, open access, gender diversity	Papers and citation, open access, gender diversity, collaboration	Web of Science	Papers (2015-2018) Citation (2019)
The Center for World University Rankings (CWUR)-2020	International (Saudi Arabia- 40%)	Research output (10%), high-quality publications (10%), influence (10%), and citations (10%)	Paper, citation, research influence	Web of Science	10 years (high quality publication)

Research performance indicators in university rankings

| Scimago Institutions Ranking-2020 | International (Spain-50%) | Normalized impact (13%), excellence with leadership (8%), output (8%), scientific leadership (5%), not own journals outputs (3%), own journals (3%), excellence (2%), high quality publications (2%), international collaboration (2%), open access (2%), scientific talent pool (2%) | Outputs, impact, excellence, leadership, publishing services, research quality, international collaboration, open access, number of researchers | Scopus | 2014-2018 |

Research performance indicators in university rankings

U-Multirank-2020	International (Germany-not mentioned on the website)	External research income, doctorate productivity, research publications, citation rate, top-cited papers, interdisciplinary publications, research orientation of teaching, research publications (size-normalized), post-doc positions, art-related output, professional publications, strategic research partnerships, open access publication, international research grants, International joint publications, regional joint publications, income from regional sources	Research income, doctoral and post-doc students, papers, citation, education, research collaboration, research grant, open access	Web of Science	Not mentioned

Research performance indicators in university rankings

| U.S. News & world report's best global universities ranking-2021 | International (United States-100%) | Global research reputation (12.5%), regional research reputation (12.5%), publications (10%), books (2.5%), conferences (2.5%), normalized citation impact (10%), total citations (7.5%), number and percent of 10% most cited papers (22.5%), international collaboration relative to country (5%), international collaboration (5%), number and percent of 1% most cited papers in their respective field (10%) | Research reputation, outputs (book, papers, conference), impact, citation, scientific excellence, international collaboration | Web of Science | Five years for bibliometric indicators (2014-2018) Five years for research reputation survey (2016-2020) |

Research performance indicators in university rankings

Round university ranking-2020	International (Russia-40%)	Citations per academic and research staff (8%), doctoral degrees per admitted Ph.D. (8%), normalized citation impact (8%), papers per academic and research staff (8%), world research reputation (8%)	Papers, citation impact, citation, doctoral researchers, research reputation	Web of Science	publications: 2013-2017 Citations: 2013-2018
Universitas Indonesia GreenMetric world university ranking-2020	International (Indonesia-18%)	The ratio of sustainability research funding towards total research funding, number of scholarly publications on environment and sustainability, number of scholarly events related to environment and sustainability (18%)	Papers, research funding, research events	-	-

Research performance indicators in university rankings

ITU Quality Research Rankings (ITU-QRR)-2019	International-Muslim countries (Pakistan-not mentioned in the website)	The highest quality publications, high quality publications, medium quality publications, multi-institutional collaborations, international collaborations	Papers, collaboration	Scopus	2010-2015
Nature Index-2020	International (Germany-not mentioned)	Count and share of high-quality articles	Papers	Nature index	Annually

Research performance indicators in university rankings

SciVision university ranking-2020	International (not mentioned-52%)	Scientific reputation (4%), scientific productivity (10%), research performance (15%), average research performance (6%), top 10% highly-cited papers (1%), top 11-20% highly-cited papers (3%), high-impact researchers (0.5%), international researchers (0.5%), international collaboration (2%), the size of inter-organizational teams (4%), the scientific impact of teams (4%), international researchers, researchers employed by high-impact universities (2%)	Scientific reputation, papers, research performance (citation), research quality, research impact, international collaboration, organizational collaboration, citation, researchers	Web of Science	2013-2016

Research performance indicators in university rankings

| University ranking by academic performance (URAP)-2021 | International (Turkey-100%) | Article (21%), citation (21%), total document (10%), article impact total (18%), citation impact total (15%), international collaboration (15%) | Papers, citation, scientific impact, international collaboration | Web of Science | 2015-2019 |

Research performance indicators in university rankings

ISC world university ranking, ISC Islamic world university ranking-2020	International (Iran-80%)	Research volume (25%), time cited (15%), number of articles in a top journal (Q1, Nature, Science, Nature Index) (15%), impact relative to the world (4%), category normalized citation impact (1%), an international collaboration (10%), number of collaborating countries in joint publication (4%), international reputation (1%), negative international reputation, highly cited faculty members (5%)	Papers, citation, citation impact, international collaboration, international reputation, negative international reputation, high-impact researchers	Web of Science	3 years

Research performance indicators in university rankings

Chinese universities ranking, Chinese medical universities ranking	National (China-40%)	Number of papers in Scopus (10%), Field Weighted Citation Impact (FWCI=Quality of Research, 10%), world top 1% most cited paper (10%), Chinese most cited researchers (10%)	Papers, other academic documents (like proceedings), impact, researchers	Scopus	2013-2017
Greater china ranking	National (China-45%)	Annual research income (5%), Nature & Science papers (10%), SCIE & SSCI papers (10%), international patents (10%), highly cited researchers (10%)	Papers, research income, patent, high-impact researchers	Nature, Science, Web of Science, Derwent	Past year and five years

Research performance indicators in university rankings

Research Excellence Framework	National (United Kingdom-100)	quality of outputs (e.g., publications, performances, and exhibitions), their impact beyond academia (on the economy, society, culture, public policy and services, health, environment, and quality of life within the UK and internationally), and the environment that supports research	Output, impact, environment	Web of Science, survey	2014

Innovation-industry indicators used in the university ranking

University ranking	indicators	Measured dimension by innovation-industry indicators	Data source
Chinese university ranking, Chinese medical universities ranking	Technology service (research income from industry), technology transfer (income from technology transfer)	Technology transfer and income from technology and industry	-
The World University Rankings	Knowledge transfer	Industry income	-
CWTS Leiden ranking	Industry publication	University-industry relationship	-

Innovation-industry indicators used in the university ranking

U-Multirank	Income from private sources, co-publications with industrial partners, patents awarded, co-patents with industry, publications cited in patents, B.A. theses with regional organizations, M.A. theses with regional organizations, patents awarded (size-normalized), industry co-patents, spin-offs, income from continuous professional development (CPD), graduate companies	Knowledge transfer	PATSTAT database
Scimago institutions rank	Innovative knowledge, technological impact, patents	Innovation and technology impact	PATSTAT database
SciVision university ranking	Science-technology linkage, university-industry collaboration, industrial impact, funded researchers, industrial researchers, technological reputation	Technological impact, technological reputation	USPTO
ISC world university ranking	Patents, industry collaboration	Innovation and technology impact	USPTO

Comparison between university rankings

- The highest researchoriented university rankings were CWTS, NTU, U.S News, URAP, and Research Excellence Framework.

- the U-Multilink and the SciVision provide more significant innovation-industry indicators. Overall, the U-Multilink and the SciVision are the most research and innovative-industry- oriented rankings among others

- European countries such as the United Kingdom, Germany, and Spain have introduced more university rankings, followed by Asian countries such as China, Saudi Arabia, and Turkey

Comparison between university rankings

- Most of these rankings are based on research performance indicators that are extracted from citation databases (Web of Science, Scopus, Google Scholar),

- A few use the information submitted by universities (survey), which provide reputation indicators regarding education and research like THE, Round, and QS.

- While, U-Multirank is a combination of educational, research, and innovational indicators. Thus, the international ranking system indicators are largely researchoriented

Comparison between university rankings

- Most of them focused on research outputs or productivity (papers) and citations show that these indicators are the main research metrics in university rankings. These metrics indicate the research quantity and quality, respectively

- Academic Ranking of World Universities (ARWU), Nature index (considering only 12 high-quality journals on its website), Greater china ranking, and ISC consider research papers published in Nature and Sciences as the highest quality journals

Comparison between university rankings

- ARWU and Greater china ranking alongside Nature & Science papers assign a weight for SCIE and SSCI articles, which may imply research impact or influence. Some of these rankings considered other productivity indicators such as books (THE world university); doctoral and art-related publication, research income and grant, interdisciplinary and professional publication (U-Multilink); books and conference papers (U.S. News); events and research funding (GreenMetric); international patents and research income (Greater china ranking); not own journals outputs and own journals (Scimago); performances and exhibitions (Research Excellence Framework).

Comparison between university rankings

- Also, the primary resource for extracting citation (research influence or impact) in most cases has been Web of Science core collection then Scopus.

- Only Webometrics ranking extracted citations from Google Scholar.

- The GreenMetric world university ranking has not been implying the source of data extraction and considers all outputs and events regarding environment and sustainability

Comparison between university rankings

- THE world university rankings, U.S. News, Round, SciVision, and ISC world university rankings consider the positive research reputation of universities as the primary research indicator for rating them.

- Only ISC world university ranking from Iran introduced a new indicator regarding reputation from 2020 named negative international reputation that implies universities with the highest number of retracted articles.

- Other rankings did not use this indicator worldwide as a negative research performance of universities

Comparison between university rankings

- most studied rankings consider research influence and impact based on different indicators like highly cited papers, top papers, citations, and highly cited researchers.

- there are different indicators such as highly cited researchers (ARWU), citation (THE), citation for 2 and 11 years (NTU), highly cited articles (Webometrics), 1%, 5%, 10%, 50% top papers, total and average citation, and normalized total and average citation (CWTS); high quality papers in top and
high influential journals, and highly cited papers (CWUR); citation and top cited papers (U Multilink); high-quality papers (Scimago); normalized citation impact, total citation, 1%, 10% highly cited papers (U.S News); citation, normalized citation impact (Round); highest, high, and medium quality papers (ITU); 10% and 11-20% highly cited papers, high impact researchers (SciVision); citation, normalized citation impact, impact relative to the world, high quality papers in Q1 journals, Nature, Science, Nature index, highly cited researchers (ISC); article impact total and citation impact total (URAP); citation impact, 1% top papers, highly cited researcher (Chinese ranking); highly cited researchers (Greater china ranking)

Comparison between university rankings

- Research Excellence Framework introduces impact beyond academia on the economy, society, culture, public policy and services, health, environment, and quality of life within the UK that other ranking has not considered.

- CWTS, U-Multilink, Scimago, U.S. News, Round, ITU, SciVision, ISC, and URAP introduced impact, influence, excellence, and normalized citation based on field or field and year

- The NTU included Excellence indicators in terms of two-year h-index, highly cited papers, and articles in high-impact journals. Other rankings applied 10% of most cited papers (Webometrics), excellence with leadership, and 10% of the most cited papers (Scimago).

- The excellence with leadership is the number of documents in which an institution is the main contributor

Comparison between university rankings

- THE is one of these rankings that separates collaboration indicators from research indicators, while most included rankings use this metric in the research evaluation of universities. THE defined this indicator as the international collaboration with a weight of 2.5%. Also, the CWTS are using organizational (100 km or 5000 km), international, and industrial (100 km or 5000 km) collaborations.

- Other related collaboration indicators include interdisciplinary publications, strategic research partnerships, international joint publications, and regional joint publications in the U-Multilink. The Scimago, U.S. News, URAP, and ISC used international collaboration metrics, but the ITU and the SciVision used both institutional and international collaborations

Comparison between university rankings

- CWTS has emphasized more open access articles and report numbers, and a portion of gold (journals that only publish open access), green (including published versions or manuscripts accepted for publication and available at repository), and bronze (re-published versions of record or manuscripts accepted for publication. The publisher has chosen to provide temporary or permanent free access) and hybrid articles (documents are in journals which provide authors the choice of publishing open access).

- Other rankings such as U-Multilink and Scimago imply the number of open access publications and have not separated their types.

Comparison between university rankings

- The CWTS is the only ranking that includes gender diversity in research performance evaluation.

- The Scimago has applied the scientific leadership as the number of papers in which a corresponding author belongs to an institution and the scientific talent pool as the total authors in an institution that contributed to the total publication outputs of that institution during a particular time.

- The GreenMetrics and Research Excellence Framework are the only rankings considering environmental factors such as environmental and sustainability publications, events and supporting environmental research

Conclusion

- Overall, the research indicators divide into six main dimensions:
- scientific or non-scientific outputs;
- Research quality or impact;
- research excellence;
- national, international, or organizational collaboration;
- open science and open access;
- reputation.
- Besides, other indicators like scientific leadership, gender diversity, scientific talent pool, own or not-own journal articles, environmental factors, and sustainability have been less applied by the university rankings that can be considered more by others.

Conclusion

- The leading innovation-industry indicators divide into knowledge transfer, technology impact, and technological reputation.

- Knowledge transfer can be defined in industry publication (university-industry relationship), and income from private sources, patents awarded, co-patents with industry, publications cited in patents, spin-offs, income from continuous professional development (CPD).

- Technological and industrial impact implies several universities papers cited by innovational or industrial publications. The technological reputation is number of university innovational and industrial papers cited by other countries' innovational and industrial publications.

- SciVision only uses this indicator.

- The science-related non-patent literature references (NPLRs) in patents are generally seen as a proxy for science-technology linkages.

- Highly-cited patents are often international breakthrough technologies.

- Successful transfer of knowledge from universities to the industry is shaped by geography, and small distances tend to have positive effects on a firm's innovation performance.

- Geographical proximity is an essential factor in university-industry R&D linkages, where the distance from the university decreases the likelihood that a firm would collaborate with the university. The five main categories of proximity are geographical, cognitive, organizational, social, and institutional

Conclusion

- there are some challenges concerning the research performance and innovation-industry
  indicators in the national and the international university rankings: modifying the indicators' weight; considering a new research performance indicator for research in the arts, humanities, and social sciences; using composite indicators or university ranking (consisting of educational, research, innovational, environmental, ethical); taking into account the scientific outputs of other non-English speaking countries and a new indicator for this; also including an indicator that defines the national and regional industry-based publications.

- Besides, it requires defining precisely indicators in a related dimension of the university rankings' website.

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