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Global Ranking framework & Indicators of Higher Educational Institutions: A Comparative Study

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Abstract:

This paper highlights on a comparative study of various global ranking framework. To define the world university ranking it follows different methodologies and indicators. Here we have discussed various ranking such as Academic Ranking of World Universities (ARWU), QS World University Ranking, Times Higher Education World University Ranking (THE) and Webometrics Ranking. The ARWU ranking follows six indicators, QS world university ranking followed six indicators, THE world University ranking follows 13 indicators and webometrics ranking followed 4 indicators. This study found that Indian Institutions are also occupying ranks in a large number of global ranking. Webometrics Ranking took most of the Indian Institutes in its list (4381). IISc Bengaluru occupied 1st rank as an Indian institute in ARWU and THE world ranking whereas IIT Bombay occupied 1st position as an Indian institute in QS world ranking and Webometrics ranking.

Keywords: Global ranking, ARWU, QS Ranking, THE Ranking, Webometrics, Methodology, Indicators, Indian Institute Ranking

1. Introduction: Higher education University rankings have an important impact on higher educational institutions (HEIs). Now a days both national and international university rankings are growing vibrantly and getting more specialized focusing on research performance in order to enhance institutional reputation (Rauhvargers,2011;Shin & Toutkoushian,2011)[1-2].World University Ranking acts as a reference for students selection of universities and scholar mobility across the globe, provide guide to public policies, helps in decision making by funding agencies and university leaders, and even plays a role in positioning and measuring the performance of higher educational institutions in terms of domestic and global contexts (Altbach, 2006, 2012; Bastedo & Bowman,2011; Huisman & Currie,2004; Salmi & Saroyan,2007;Williams,2008)[3-8].World university ranking influenced strategic direction and decisions made by senior higher education administrators, including how they react among and between leaders of other HEIs (Hazelkorn,2009)[9].These rankings

help to get sustained funding and also attract students and scholars to honourable institute worldwide. This ranking is like jumping into a risky venture; rather than focusing their decision on which institution to attend based on outstanding academic performance, students often make their choice on institutional reputation (Taylor & Braddock, 2007)[10].Here we have considered four prestigious ranking such as Academic ranking of world universities(ARWU), Quacquarelli Symonds World University Ranking (QS), Times Higher Education World University Ranking (THE) and Webometrics Ranking to define their methodologies and indicators. We also focussed on Indian institutes occupying top ranks in these ranking system and their place in listed ranks.

2. Objectives:

1. To discuss about the four Global higher educational rankings such as Academic Ranking of World Universities (ARWU), Times Higher Education World University Ranking (THE), Quacquarelli Symonds World University Ranking(QS)and Webometrics Ranking.

2. To make a comparison of these rankings on the basis of its indicators and weightage.

3. To discover various parameters and indicators of these ranking framework.

4. To highlight ranks obtained by India's top institutions in these global rankings.

3. Literature review:

Ioannidis and others (2007)[11] made a critical appraisal on International ranking systems for universities and institutions. They reviewed two most visible ranking system, Shanghai Jiao Tong University "Academic Ranking of World Universities" and the Times Higher Education World University Rankings. According to their study only 133 universities shared their top 200 lists. The other existing international ranking systems suggests that generic challenges include adjustment for institutional size, definition of institutions implications of average measurement of excellence and extremes are allocated.

Thakur (2007)[12] made a study on impact of ranking systems on higher education. The author provided an overview of ranking systems in which Australian universities impact ranking on higher education and its stakeholders are discussed.

Aguillo and others (2010)[13] made a comparative study on university rankings published by QS for the Times Higher education Supplement, the Shanghai Jiao Tong University, and accreditation council of Taiwan and ranking by the cybermetric lab at CSIC. They found that though different methodologies were applied there were some similarities among these ranking. The difference was seen between rankings provided by the QS-Times Higher Education Supplement and the Ranking Web of the webometric lab. Similarities were observed between Taiwanese and Leiden rankings.

Yeravdekar and Tiwari (2014)[14] did a study on global ranking of higher education institutions and non-presence of Indian's higher education systems. They focussed on the interconnectedness that has resulted from globalisation of higher education system in the world over. According to them India's education system is became knowledge economy. They emphasized on global ranking and reasons behind India's non-appearance in global ranking of higher education system at a larger level.

Reddy, Xie and Tang (2016)[15] focussed on a World University Ranking between India and China's Higher education. They examined on the current state of higher education, high impact research metrics, WRFRanking in India. More emphasized is given on to reveal the progress of management research metrics, business school accreditations and rankings, and abstracting and indexing of publishing journals. They also discussed policy guidelines related to research funding, collaborative research projects and research assessment council for imparting quality academic practices.

Goncalves and Calderon (2017)[16] emphasized on global academic rankings implications in higher education. They found three types of implications; first is internationalisation and competition, governance and autonomy and quality and productivity.

Hou and Jacob (2017)[17] did a regression analysis and investigates the indicator contribution to the Academic ranking of world universities (ARWU), Times Higher Education (THE) and QS World University Ranking. ARWU system indicated 3 contributions other than that QS and THE systems is followed expert based reputation most.

Das, Subramanian and Roy Chowdhury (2019)[18] did a comparative study on webometrics ranking and National Institutional Ranking framework. They defined various parameters of both the ranking systems. According to their study Indian Institute of Technology, Bombay is the top in webometrics ranking whereas IIT Madras is the top in NIRF ranking system.

4. Methodology:

All data were extracted from the authentic websites[19-24] of ARWU, *THE*, QS and webometrics ranking. We chose the top 500 universities from each selected ranking system in accordance with their 2020 world university rankings released on their websites. For each ranking system, the data we collected included the percentage for every criterion and the overall scores, as well as the ranking of Indian Institute among this 500 institutions worldwide. All data were analysed and structured in a systematic way.

5. Brief introduction of the selected ranking systems:

Table 1: Features of World University Rankings

Parameters	**Academic Ranking of world University (ARWU)**	**QS World University Ranking**	**Times Higher education world university ranking (THE)**	**Webometrics Ranking**
Year of establishment	2003	2004 (partnership with THE till 2009 from 2010 its own)	2004	2004
Initiative taken by	Academic Institution (Shanghai Jiao Tong University)	Media (Quacquarelli Symonds)	Media (Thomson Reuters)	Conjo superior De Investigaciones Cientificas(CSIC)
Country of origin	China	United Kingdom	United Kingdom	Spain

No. of indicators	6	6	13	4
Data Source	Thompson Reuter's Web of science databases, Resources of National Agencies	Scopus databases, University portfolio Survey	Thompsons Reuters web of Science, University portfolio survey	Reliable open data sources, web presence
Result published on web	Yes	Yes	Yes	Yes
Ordinal ranking	Single ranks up to 100 then groups (such as 101-150, 151-200)	Single ranks till 500 then groups (such as 501-510, 511-520)	Single ranks to 200 then groups (such as 201-250,251-300)	Single ranks

Source: Secondary data

5.1. Analysis:

Table 1 shows that ARWU, QS, THE and Webometrics World University Rankings are the most frequently used rankings framework for academic institutions with its brief features. The first global ranking is ARWU. It was first published in June, 2003 by the centre for world-class universities (CWCU), Graduate school of education of Shanghai Jiao Tong University, china (Shanghairanking.com, 2020). It uses six indicators to rank world universities including the number of alumni and staff winning Nobel Prize and respective field 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. [12]

QS Ranking is published by Quacquarelli Symonds Company. It started ranking from 2004 along with the partnership of Times Higher Education (THE) but from 2010 it started its own ranking. It follows six indicators, Scopus databases and university portfolio survey is the main source of its data. [12]

THE world university ranking is started from 2004 by Thomson Reuters. Data are collected from Thompson Reuters Web of science, university portfolio survey.

Webometrics ranking is an initiative of cybermetrics lab which is a research group of Consejo Superior de Investigaciones Cientificas (CSIS), the largest research body of Spain. Since 2004 it was published twice a year covering more than 30000 higher education institutions worldwide. The aim of the ranking is to promote academic web presence, supporting the open access initiative for increasing transfer of scientific and cultural knowledge. [15, 16]

The four ranking systems publish their results online using ordinal ranking. ARWU follows single ranking up to 100 then groups like 101-150,151-200,201-250; QS world university ranking follows single ranks till 500 then groups like 501-510,511-520,521-530; THE world university ranking follows single rank to 200 then groups like 201-250,251-300,301-350;

only webometrics ranking follows single rank but it follows presence rank, impact rank, openness rank and excellence rank as per its indicators.[19-24]

5.2. Indicators and weightage:

Table 2: Indicators and weightage of listed global ranking system

	ARWU Ranking		**THE Ranking**		**QS Ranking**		**Webometrics Ranking**	
Area of Coverage	1800+ Universities		1500+ Universities		1000+ Universities		30,000+ HEIs	
Criteria or weightage								
1.	**Quality of Education**	30%	**Teaching**	30%	**Academic Reputation**	40%	**Visibility**	50%
2.	**Quality of Faculty**	40%	**Research**	30%	**Employer reputation**	10%	**Excellence**	35%
3.	**Research Output**	20%	**Citation impact**	30%	**faculty-student ratio**	20%	**Transparency or openness**	10%
4.	**Per capita performance**	10%	**International outlook**	7.5%	**Citation perfectly**	20%	**Presence**	5%
			Industry Income	2.5%	**International faculty ratio**	5%		
					International student ratio	5%		
India's Position (Out of top 500 institutions)	15 Indian Institutions in entire list (0 in 1st 500)		61 Indian Institutions in entire list (0 in 1st 200, 3 in 301-500)		19 Indian institutions in entire list (3 in 1st 200, 5 in 201-500)		Total 4381 Indian institutions in entire list (0 in 1st 500)	

Source: Secondary data

5.2.1. Analysis:

Table 2 shows that ARWU ranking system includes six indicators among four dimensions (Shanghai Jiao Tong University, 2020). Quality of education mentions two criteria that is alumni and faculty with Nobel prize and field medals (30%).Quality of faculty indicates Highly cited researchers and the papers published in Nature and Science (40%), the third indicator mentions the research output of papers indexed in Science citation index-expanded and social science citation index (20%) and the fourth per capita performance include the performance of an institution (10%).

THE system uses 13 indicators for five dimensions (Thomson Reuters, 2020). First, the teaching dimension is assigned a weightage of 30% and is determined by five indicators teaching reputation survey, staff-to-student ratio, doctorate-to-bachelor ratio, doctorate awards by an institution and institutional income scaled against academic staff numbers. Secondly, the research dimensions have a 30% share and is established through a research reputation survey, research grants and the number of papers published in academic journals. The third dimension is citation impact, given a weightage of 30%. The international outlook

dimension of an institution is assigned a weightage of 7.5% and is determined by the international-to-domestic student ratio, international-to-domestic staff ratio, and the number of internationally co-authored research papers. At last the industry income bears 2.5% weightage.

QS Ranking framework (Quacquarelli Symonds, 2020) out of the six indicators included in the QS system, the most important is the academic peer reputation survey, with a weightage of 40%. Another reputation survey addresses employers and contributes 10% to the ranking; the two indicators of citations per faculty and faculty-student ratio contribute 20% each to the overall score. The numbers of international students and faculty indicators have a weight of 5% each.

Webometrics ranking framework is based on four indicators (Webometrics.info, 2020).The first indicator depends on Google where size of main web domain of the institution is included which bears 5% of weightage. The second is visibility that includes number of external networks linked to institutional webpage and bears 50% weightage; the next is transparency or openness which includes top cited researchers that is 10%. Excellence depends on top cited papers and their ranking on SCImago with a weightage of 35%.

5.3. Presence of Indian Institutions on global rankings 2020:

Table 3: Ranking of Indian institute in worldwide (According to year 2020)

Sl. No.	Global rankings	Name of Indian Institutions	World rank (According to listed global ranking 2020)	Regional rank(According to NIRF ranking 2020)
1.	**ARWU**	Indian Institute of Science, Bengaluru	501-600	2
2.	**QS ranking**	Indian Institute of Technology, Bombay	172	4
3.	**THE ranking**	Indian Institute of Science, Bengaluru	301-350	2
4.	**Webometrics ranking**	Indian Institute of Technology,Bombay	514	4

Source: Secondary data

5.3.1. Analysis:

Table 3 shows top and first Indian institute ranked in global ranking. According to ARWU ranking Indian Institute of Science, Bengaluru took first position with its world rank of 501-600 whereas its NIRF ranking[25] is 2. The same institute ranked first in the list of Times Higher Education World University ranking also but its world rank is 301-350. Indian Institute of Technology, Bombay attained 1st position in both QS ranking and Webometrics ranking but the world rank in QS ranking is 172 and for webometrics ranking is 514 whereas its NIRF ranking is 4.

6. Conclusion:

The comparison of these ranking reveals that they followed different methodologies for defining various institutional ranking. Out of these four ranking systems ARWU framework provided ranking on the quality of education, faculty, research output and per capita performance ranking depends on academic and employer reputation, faculty-student ratio, citation impact and international faculty-student ratio; THE ranking differentiates on

the basis of teaching, research, citation impact, international outlook and industry income whereas webometrics ranking exaggerated on visibility, excellence, transparency and presence. But in all, these global ranking also affects Indian Institutions also. Various Indian institutions are taking part in the global rankings obtaining satisfactory positions. All the rankings are not following their indicators properly, sometimes it may create some criticism also. So, we have to think about the original methodology in ranking institutions as it helps the scholars and students to discover educational institutions based on their required academic outfit.

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