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Asian top universities in six world university ranking systems

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Abstract

There are a variety of ranking systems for universities throughout the different continents of the world. The majority of the world ranking systems have paid special attention toward evaluation of universities and higher education institutions at the national and international level.

This paper tries to study the similarities and status of top Asian universities in the list of top 200 universities by these world ranking systems.

Findings show that there are some parallelisms among these international rankings. For example it was found some correlations between QS-Webometrics rankings ($R=0.78$); QS-THE rankings ($R=0.53$); and Shanghai-HEEACT rankings ($R=0.58$). The highest correlation rate belongs to QS-Webometrics ($R=0.78$).

The findings show no evidence to prove that the origin country of ranking system has any bias toward the rank of universities of its own country among other countries. For instance QS ranking of the United States classifies many universities of China and Japan as top Asian universities. HEEACT Ranking System of Taiwan includes just one university of Taiwan in the high ranking category (as other rankings do). Shanghai Ranking of China assigns a lower grade to universities of China and Hong Kong in comparison with QS ranking of the USA.

Finally, some suggestions are made to improve the benefits of the ranking systems in order to promote the situation of higher education in the world, and recommendations for combining the indicators of these ranking systems to have a more comprehensive one for the world.

Keywords

Asian Universities, Shanghai ranking, QS ranking, THE ranking, HEEACT ranking, Webometrics ranking, Leiden University ranking

Introduction

Higher education institutions and universities struggle to acquire higher positions in their country region and even in the world. They usually have similar goals and outputs including graduate and postgraduate students' research activities and reports, and dissemination of knowledge among the scholarly communities proposing solutions for eliminating the social economical and political problems and collaborating with society in many cases (Lepori, 2007).

The various outputs of higher educational institutions, particularly universities, are considered in ranking them from different points of view. Ranking the educational groups, colleges, universities, national, regional and international educational institutes are the cases that have been considered as an important topic by the researchers. The published annual ranking reports and the high number of conferences and workshops held in this area support this claim.

The higher education institutes benefit from these ranking systems as a progress tool that shows their educational and research superiorities (Aguillo et al., 2010). However, the indicators used for ranking as well the level of the ranking systems are different. The most important indicators used for this type of evaluation are influence of research, number of faculty members, number of students, number of Nobel Prize winners, number of highly cited researchers, and articles published in Nature and Science journals.

A few countries have their own national ranking systems for evaluating their universities and higher education institutions (e.g. ranking systems in India, Iran, Japan, Pakistan, Philippines, Southern Korea, France, Germany, Italy, etc.) and many countries take advantage of the regional and international ranking systems such as Webometrics, Shanghai, QS, SCImago, THE (Times Higher Education), HEEACT (ranking of scientific papers), and Leiden University ranking based on new crown indicator.

Some believe that when the universities of a country are judged by her national system some unconscious bias may be observed. Our nature as a scholarly society is that we are willing to magnify our university (Oswald, 2010). For example, in one of the ranking systems that have been conducted by RatER, one of the non-commercial agencies of Russia, Moscow State University has gained the 5th rank (before Harvard and Cambridge Universities) and some questions have been posed due to this (Baty, 2010).

Shanghai ranking is the most problematic ranking system of universities. Many researchers have questioned Shanghai ranking system (Dill and Soo, 2005; Zitt and Filliatreau, 2006; van Raan, 2006; Bucla-Casal et al 2007; Ioannidis et al., 2007), and some believe that despite the media coverage, this ranking system is not an appropriate and relevant tool for discussing the quality of academic institutes (Billaut et al., 2010). Other researchers argue that Shanghai ranking system is a one-dimensional reliable scale at a macro level. A few studies have considered the similarities of ranking systems indicators (Docampo, 2011). Some of them believe that the weakness of Webometrics ranking is related to universities' name variation and not following the certain policies in nomenclature of websites, bandwidth change of universities, using URLs and different domains (Aguillo et al, 2010).

Problem Statement

As previously mentioned, various ranking systems (more than 10 international ranking systems) have been designed to evaluate and rank universities and each of them consider different indicators. Now the question is, should we increase the number of these ranking systems? Are their results as different as they claim? Or can we integrate them or select one of them as a standard? Are the outputs of these systems really different?

In this paper the collected data from six ranking systems including Shanghai QS, Webometrics, HEEACT, THE and Leiden University rankings are analyzed according to their performance in

ranking the top Asian universities. The reason for the selection of these six ranking systems is their publicity and availability of their data. The characteristics of these six rankings are shown in Table 1.

Analyzing the top 200 universities according to these ranking systems, we explore the differences and similarities of these systems in ranking the top Asian universities., Based on our literature review of previously conducted studies, the hypotheses of this study are as following:

Hypothesis1. Although the ranking systems of the worldwide universities follow roughly different patterns in ranking, the outputs of these systems show significant correlations.

Hypothesis2. The origin country of university ranking system has no impact on the rank of its universities in *Top League Member* of that university ranking system.

Table 1. Features of International University Rankings

Ranking System Name	Publisher	Ranking originati on country	Since (Year)	Which Indicators?	Website
QS	Quacquarelli Symonds	United States	2004	<ul style="list-style-type: none"> • Citations per paper 	http://www.topuniversities.com/
Times Higher Education (THE)	Thomson Reuters and	United Kingdom	2004	<ul style="list-style-type: none"> • 10% Economic activity/Innovation • 10% International diversity • 25% Institutional indicators • 55% Research indicators 	http://www.timeshighereducation.co.uk/world-university-rankings/
Leiden	Centre for Science and Technology Studies (CWTS), Leiden University	Netherland	2007	<ul style="list-style-type: none"> • Citation per Publications • Normalized citation ratio (a size-independent, field-normalized average impact) 	http://www.cwts.nl/ranking/LeidenRankingWebSite.html
Webometrics	Cybermetrics Lab of Consejo Superior de Investigaciones Cientificas (CSIC)	Spain	2004	<ul style="list-style-type: none"> • Size – Number of pages recovered from four engines: Google, Yahoo, Live Search and Exalead. • Visibility – The total number of unique external links received (inlinks) by a site can be only confidently obtained from Yahoo Search • Rich Files – Selecting the following formats: Adobe Acrobat (.pdf), Adobe PostScript (.ps), Microsoft Word (.doc) and Microsoft Powerpoint (.ppt) • Scholar – number of papers and citations for each academic domain via Google Scholar 	http://www.Webometrics.info/index.html
Shanghai	Institute of Higher Education of	China	2003	<ul style="list-style-type: none"> • number of alumni and staff winning Nobel 	http://www.arwu.org/aboutARWU.jsp

	Shanghai Jiao Tong University			Prizes and Fields Medals <ul style="list-style-type: none"> • Number of highly cited researchers selected by Thomson Scientific • Number of articles published in journals of <i>Nature</i> and <i>Science</i> • Number of articles indexed in Science Citation Index - Expanded and Social Sciences Citation Index, and per capita performance with respect to the size of an institution 	
HEEACT	Higher education evaluation and accreditation council of Taiwan	Taiwan	2007	<ul style="list-style-type: none"> • Research productivity (accounting for 20% of the score) • Research impact (30%) • Research excellence (50%) 	http://ranking.heeact.edu.tw/en-us/2010/Page/Background

Data Gathering Procedure

For this study, the data were collected and analyzed as follows:

1. First, *Top 200 League Table* of QS ranking system in 2010 was extracted.
2. The ranks of Asian universities were searched in *Top 200 League Table* of QS and other five ranking systems (which were published in 2010). In this step, the first 200 universities of these ranking systems were searched and it means that if a university name was not in *Top 200 League Table* of noted ranking system, its place was left blank.
3. The collected data related to each of these six systems were imported in *Statistical Package for Social Science* (SPSS) version 15 and were analyzed.

The status and rank of Asian top universities among *Top 200 League Table* of mentioned international university rankings are presented in table 2.

Table 2. The Ranks of Asian Top Universities in Top 200 League Table of Six international Ranking Systems

Country	University	QS 2010	Shanghai 2010	Webometrics 2010-	Leiden 2010	HEEACT 2010	THE 2010
Japan	The University of Tokyo	24	20	51	177	14	26
	Kyoto University	25	24	83	191	28	57
	Osaka University	49	75		190	38	130
	Tokyo Institute of Technology	60	118			154	112
	Nagoya University	91	79			113	
	Tohoku University	102	84			65	132
	Kyushu University	153	161			156	
	University of Tsukuba	172	195				
	Hokkaido University	175	158			177	
Australia	Waseda University	182					
	Australian National University	20	59	73	141	166	43
	The University of Sydney	37	92	139	171	69	71
	The University of Melbourne	38	62	135	134	43	36
	The University of Queensland	43	116	102	142	95	81
	The University of New South Wales	46	190	153	182	147	152
	Monash University	61	163	103	189	130	178
	The University of Western Australia	89	117			199	
China	The University of Adelaide	103					73
	Peking University	47	167			124	37
	Tsinghua University	54	178			117	58
	Fudan University	105					
	Shanghai Jiao Tong University	151				183	
Hong Kong	University of Science and Technology of China	154					49
	University of Hong Kong	23		78	151	179	21
	The Hong Kong University of Science and Technology	40					41
	The Chinese University of Hong Kong	42	171	112			
	City University of Hong Kong	129					
Korea, South	The Hong Kong Polytechnic University	166					149
	Seoul National University	50	111			67	109
	KAIST - Korea Advanced Institute of Science & Technology	79		200	196		79
	Pohang University of Science And Technology (POSTECH)	112					28
	Yonsei University	142				160	190
Israel	Korea University	191					
	Hebrew University of Jerusalem	109	72	152	180	139	
	Tel Aviv University	138	114			103	
Taiwan	Technion - Israel Institute of Technology	159					
	National Taiwan University	94	107	140		114	115

Country	University	QS 2010	Shanghai 2010	Webometrics 2010-	Leiden 2010	HEEACT 2010	THE 2010
	National Tsing Hua University	196					107
Singapore	National University of Singapore	31	108	124	150	84	34
	Nanyang Technological University	74					174
Thailand	Chulalongkorn University	180					
India	Indian Institute of Technology Bombay	187					

Findings

Table 3 includes a statistical description related to the ranking of Asian universities in the Top 200 University list of these six ranking systems. As we see, the number of Asian universities listed in HEEACT, Shanghai, and THE rankings (25, 24 and 26) and Webometrics and Leiden University rankings (with 14, and 13 universities) are not equal.

Table 3. Descriptive Statistics

University Ranking System	Number of Asian Universities in Top 200 Universities of the World	The Worst Ranks of Asian Top Universities in Noted Rankings	The Best Ranks of Asian Top Universities in Noted Rankings	Mean	Std. Deviation
QS	42	20	196	98.1667	57.01259
SHANGHAI	24	20	195	114.2083	50.09467
WEBMTRIC	14	51	200	117.5000	39.42617
LEIDEN	13	134	196	168.7692	22.04977
HEEACT	25	14	199	114.5600	52.70443
THE	26	21	190	87.7692	52.12931
Valid N (listwise)	9				

However, Spearman's correlation analysis was used to show if the ranking of Asian universities in these six world university ranking systems have similarities or differences. As shown in the Table 4, some ranking systems have significant correlation with each other. The highest rate of correlation belongs to Webometrics and QS ($Rho=0.78$) rankings, and the correlation between QS and THE ($Rho=0.53$), and Shanghai and HEEACT ($Rho=0.58$) rankings are in the next levels.

Moreover, the relatively high correlation rate of the outputs of these ranking systems (e.g. Webometrics and QS ($Rho=0.78$)) shows the convergences and parallelism of these ranking systems. And, consequently, the first hypothesis of this study is confirmed.

Table 4. Investigating the Correlation among Six World University Ranking Systems in Ranking the Asian Universities

			QS	SHANGHAI	WEBMTRIC	LEIDEN	HEEACT	THE
rho	QS	Correlation Coefficient	1.000	.404	.785(**)	.505	.388	.531(**)
		Sig. (2-tailed)	.	.050	.001	.078	.055	.005
		N	42	24	14	13	25	26
	SHANGHAI	Correlation Coefficient	.404	1.000	.483	.082	.581(**)	.421
		Sig. (2-tailed)	.050	.	.112	.811	.005	.105
		N	24	24	12	11	22	16
	WEBMTRIC	Correlation Coefficient	.785(**)	.483	1.000	.357	.154	.573
		Sig. (2-tailed)	.001	.112	.	.255	.633	.051
		N	14	12	14	12	12	12
	LEIDEN	Correlation Coefficient	.505	.082	.357	1.000	-.280	.455
		Sig. (2-tailed)	.078	.811	.255	.	.379	.138
		N	13	11	12	13	12	12
	HEEACT	Correlation Coefficient	.388	.581(**)	.154	-.280	1.000	.162
		Sig. (2-tailed)	.055	.005	.633	.379	.	.521
		N	25	22	12	12	25	18
	THE	Correlation Coefficient	.531(**)	.421	.573	.455	.162	1.000
		Sig. (2-tailed)	.005	.105	.051	.138	.521	.
		N	26	16	12	12	18	26

Conclusion

At the beginning of this study we had two Hypotheses. The results show that though the studied ranking systems use different indicators, the concluded results show some parallelism. Thus there have been some fairly significant correlations among many ranking outputs. It can be suggested to integrate some of them in one evaluating system to be used as standard or international evaluation criteria for the whole world. As a conclusion the first Hypothesis of this study is confirmed.

Also it has been said that the results of ranking systems are influenced by the origin country of ranking (Baty, 2010) and our nature as a scholarly society is that we are willing to magnify our own universities (Oswald, 2010). The findings of this study do not support these statements. There is no evidence in our findings to show that the origin country of ranking is biased in favour of its universities in the ranking League Table.

QS Ranking, which was built in United States, ranks many universities of China and Japan in the top 200 universities. HEEACT ranking, which was developed in Taiwan, ranks just one university of Taiwan in the ranking (as other rankings rank just this one). Shanghai ranking, which is an initiative of China, ranks a few universities of China and Hong Kong in the top 200 universities of the world, in comparison to QS ranking which was developed in USA. Thus our second Hypothesis is also confirmed.

However some suggestions are also made to decrease the parallelism and establish better ranking systems:

1. Concerning the significant correlations among QS-THE and fairly significant correlations between Shanghai-HEEACT, and Webometrics-THE rankings, it is suggested to combine the ranking indicators of these systems to have a comprehensive rankings system. It seems that building just one ranking system based on the integration of all ranking systems should be designed to prevent the variation in results of these systems.
2. Representatives of skilled specialists in ranking systems from different parts of the world should be invited to establish an international ranking system to be used by all countries. An international ranking system can decrease the influence of one country on the evaluation result. Specialists of worldwide ranking can be asked to collaborate and the weights of each of the indicators may be identified based on consensus techniques (such as Delphi approach).

Recommendations for further research

It seems that the following topics deserve more attention in future studies:

- How do the ranking systems impact the gaps between rich and poor countries universities and higher education institutions?
- Is a national ranking system for evaluation of researchers of a country an appropriate method for promotion of the researcher of that country?
- How we can integrate the national ranking systems with those considered as international?

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