

# Scholarly Communication and Institutional Ranking: A Study Based on NIRF

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## Abstract

*The purpose of this study is to find out the link between scholarly communication and institutional ranking. The study covers National Institutional Ranking Framework (NIRF) of 2017 in relation to the scholarly productivity of top ranked institutions. The study analyses the parameters of two international ranking agencies and NIRF. The data for the study were collected through web content analysis. The study found that there is a significant correlation between scholarly communication and institutional ranking.*

**Keywords:** Academic Ranking, Institutional Ranking, NIRF, Scholarly Communication

## 1. Introduction

Scholarly communication is the core part of research. Formal and informal communication among scientists to exchange ideas and discuss research is a significant part of scientific research process (De Silva & Vance, 2017). The history of formal scientific scholarly communication is traced back to 1665 with the formation of the Royal Society in 1660. While the process of scholarly communication has undergone intense changes, the fundamental purpose remains unchanged. Research productivity denotes the peer reviewed journal articles counted in databases used by rankers (Stack, 2016). The number of scholarly articles by an institution reflects its research performance. Hence, all ranking agencies give prime importance to the scholarly output of an institution. This paper examines the relationship between scholarly communication and institutional ranking.

## 2. NIRF Ranking

The Government of India introduced the National Institutional Ranking Framework (NIRF), an authentic mechanism to evaluate universities and higher education institutions in the country under the Ministry of Human Resource Development (MHRD) in September 2015. NIRF published its first rank list in April 2016. In the first phase about 3500 institutions voluntarily participated in the process. It was a discipline specific ranking. It identified 100 top institutions each under four categories of institutes, universities, engineering, management and pharmacy. The NIRF used five broad parameters for ranking purpose. These five parameters have been further elaborated into suitable sub-heads. Each broad head has an overall weight assigned to it. NIRF 2017 was published in April 3 2017. This year NIRF published an overall ranking in addition to the discipline specific ranking.

## 3. Objectives

Institutional ranking is a global phenomenon. Rankings bring valuable information about the



quality of universities and higher education systems. Rankings influence students' enrolment. It is a key part of marketing strategies (Stack, 2016). Indian institutions were ranked by global ranking agencies. However a national ranking process was absent in India until 2016. The NIRF ranking has stimulated academic discourse among educators. This study is an attempt to

- ❖ Examine ranking parameters of World University ranking agencies
- ❖ Examine the ranking patterns of NIRF ranking
- ❖ Examine the correlation of scholarly communication and institutional ranking

#### **4. Related Literature**

Several studies have analysed the indicators of different ranking systems in the field of higher education. Fewer studies have dealt with the relation between research performance and ranking of universities. Buéla-Casal et al. (2007) made a comparative analysis of four major international university rankings. Though the parameters are different, it is evident that research productivity of universities plays a crucial role in all ranking systems. All the four selected international rankings included an indicator for quality of research which was the most frequently used and most significant indicator across the international university rankings. Many studies have used bibliometric methods for evaluating institutional ranking. Huang (2012) calculated the ranking of universities all over the world using their h-index scores as a measure of research performance. H-index was calculated using the number of papers and citations in each university from Web of Science, including the Science Citation Index and Social Science Citation

Index. The H-index ranking was correlated in this study with the 2007 Shanghai Ranking results. High correlation results proved that H-index is valid in the assessment of research performance at the university level. Still there were some inconsistencies in the two ranking systems which were attributed to self-citations, differences in number of staff etc. Gupta (2010) proposed a new methodology for ranking top 50 Indian Universities with high research output during a ten years period from 1999-2008. It was based on the publications data available in Scopus database. Several ways of ranking performance is evaluated by quantity of output, by quality or by h-index, and combining quantity and quality. It presented ranking of 50 Indian universities, based on a new performance indicator (p), which is a composite of quantity and quality. The study found strong correlation between citation parameter; a measure of quality and new performance index p and also strong correlation between H-index and new performance indicator 'p'. There is lack of studies that examines the relationship between scholarly communication and institutional ranking.

#### **5. Methodology**

The data for the study were collected through web content analysis. Web content analysis is the application of traditional content analysis techniques to the web (Herring, 2009). The data were collected from the official websites of Times Higher Education World University Rankings, QS World University Rankings and NIRF. Even though there are many world university ranking agencies, this study is limited to Times Higher Education World University Rankings and QS World University Rankings. The study is also limited to the top 100 institutions in NIRF 2017. CORREL function in

Microsoft Excel 2010 was used to find out the correlation coefficient to determine the relationship between the overall score and research performance score of top 100 institutions in NIRF ranking -2017.

## 6. Findings

### 6.1 Parameters of Rankings Agencies

All ranking processes involve parameters to measure the performance of universities. Table- 1 shows the parameters set by Times Higher Education World University Ranking (Times), QS World University Ranking and NIRF.

**Table-1: Parameters of Rankings Agencies**

Rankings	Parameters					Total
Times	Teaching (the learning environment)	Research (volume, income and reputation)	Citations (research influence)	International outlook (staff, students and research)	Industry income (knowledge transfer)	Marks
	30%	30%	30%	7.5%	2.5%	100
QS	Academic reputation	Employer reputation	Student-to faculty ratio	Citations per faculty	International faculty ratio & International student ratio	100
Marks	40%	10%	20%	20%	5%	100
NIRF	Teaching, Learning and Resources (TLR)	Research & Professional Practice	Graduation Outcomes	Outreach and Inclusivity	Perception	
Weightage	0.30	0.30	0.20	0.10	0.10	100

Source: (The QS World Rankings Methodology, 2017), (World University Ranking 2016-17 Methodology, 2017).

From the Table-1, it can be seen that Times, QS and NIRF rankings agree on many parameters. The parameters Graduate outcome in NIRF, International outlook in Times ranking and Employer reputation in QS ranking correspond to the same idea. They

denote the ability of a university to produce best graduates. The Outreach and Inclusivity parameter in NIRF ranking, International Students outlook in Times ranking and International Student Ratio in QS ranking go similar. It denotes diversity in student

community. The parameters Perception in NIRF, Research reputation in Times ranking and Employer reputation in QS ranking resemble identical ideas. They cover the peer and public perception. The area of scholarly communication is represented by research volume and citation by Times, Citation per faculty by QS and Research and Professional practice by NIRF. Hence, scholarly communication becomes one of the important factors of ranking. While NIRF collected data on research output and citations from Web of Science, Scopus and Indian Citation Index, both Times and QS World University Ranking depended on Scopus database for this data.

## 6.2 NIRF Ranking and Scholarly communication

NIRF methodology is based on developing a set of metrics for ranking of academic institutions and the parameters agreed upon by the core committee. The second parameter 'Research and Professional Practice' (RPC) measures scholarly communication. It is divided into four subheads i.e. Combined metric for Publications (PU), Combined metric for Quality of Publications (QP), IPR and Patents: Filed, Published, Granted and Licensed (IPR) and Footprint of Projects, Professional Practice and Executive Development Programs (FPPP). It has given 100 marks and a ranking weight of 0.30 which is equal to first parameter TLR's ranking weight. Its overall assessment metric is as follows:

$$RP=PU+QP+IPR+FPPP$$

**RP:** Research and Professional Practice (100)

**PU:** Combined Metric for Publications (30)

**QP:** Combined Metric for Quality of Publications (40)

**IPR:** Patents Filed, Published, Granted and Licensed (15)

**FPPP:** Footprint of Projects, Professional Practice & Executive Development Programs (15)

NIRF created formulas to calculate each and every subhead. PU is calculated as follows:

$$PU=30*p(P/F)$$

Where P is the number of publications over the previous three years (2013,2014 & 2015) and F is the nominal number of faculty numbers. Number of publications were taken from the Web of Science, Scopus, Indian Citation Index (ICI) etc. QP is calculated as follows:

$$QP=15*p(CC/P)+12.5*p(NCI)+12.5*p(TOP25P)$$

Here CC = total citation count over the previous three years (2013, 2014& 2015)

P = total number of publications over this period as computed for PU

NCI= field normalized citation index averaged over the previous 3 years

Top25=Number of citations in top 25 percentile averaged over the previous 3 years (NIRF, 2017)

## 6.3 NIRF Ranked institutions according to RPC

NIRF ranking is based on the overall weightage obtained for all five parameters. The investigators attempted to examine the influence of RPC score on the overall score. The RPC based score was derived from the NIRF and compared it with NIRF rank. Table-2 shows RPC score, RPC Rank, Overall Score and NIRF Rank.

Table-2 NIRF-2017 Rank list according to RPC

Sl.No	Name of Institutions	RPC Score	RPC Rank	Overall Score	NIRF Rank
1	Indian Institute of Science Bangalore	87.59	1	83.28	1
2	Indian Institute of Technology Bombay	78.14	2	71.78	3
3	Indian Institute of Technology Madras	72.6	3	73.97	2
4	Indian Institute of Technology Kharagpur	70.46	4	68.43	4
5	Indian Institute of Technology Delhi	68.48	5	64.18	5
6	Indian Institute of Technology Kanpur	62.14	6	60.69	7
7	University of Delhi	56.61	7	55.37	15
8	Indian Institute of Technology Roorkee	56.6	8	59.84	9
9	Anna University	54.58	9	56.5	13
10	Jadavpur University	54.09	10	57.32	12
11	Jawaharlal Nehru Centre for Advanced Scientific Research	51.93	11	58.25	11
12	Banaras Hindu University	49.96	12	58.92	10
13	Indian Institute of Technology Guwahati	47.46	13	60.37	8
14	Calcutta University	44.1	14	48.9	27
15	Vellore Institute of Technology	42.87	15	51.36	22
16	University of Hyderabad	42.77	16	56.3	14
17	Panjab University	40.79	17	43.13	54
18	Amrita Vishwa Vidyapeetham	39.49	18	54.7	16
19	Institute of Chemical Technology	36.82	19	44.95	41
20	Aligarh Muslim University	36.2	20	52.74	19
21	Bharathiar University	35.58	21	44.29	45
22	Savitribai Phule Pune University	35.03	22	52.81	18
23	Indian Institute of Technology (Indian School of Mines)	34.27	23	43.21	53
24	National Institute of Technology Rourkela	34.18	24	44.02	46
25	Jawaharlal Nehru University	33.96	25	61.53	6
26	Indian Agricultural Research Institute	33.6	26	51.2	23

Sl.No	Name of Institutions	RPC Score	RPC Rank	Overall Score	NIRF Rank
27	Indian Institute of Technology Indore	32.43	27	50.23	24
28	National Institute of Technology Tiruchirappalli	31.32	28	46.57	34
29	Birla Institute of Technology & Science Pilani	31.26	29	51.46	21
30	Shanmugha Arts Science Technology & Research Academy (SASTRA)	31.09	30	43.5	50
31	Manipal Academy of Higher Education Manipal	29.31	31	48.27	30
32	University of Madras	29.26	32	41.85	64
33	Thapar University	29.05	33	40.78	75
34	Tezpur University	28.83	34	43.78	48
35	Indian Institute of Science Education & Research, Pune	28.43	35	48.28	29
36	Indian Institute of Technology Hyderabad	28.02	36	49.07	26
37	Jamia Millia Islamia	27.99	37	51.75	20
38	Jamia Hamdard	27.86	38	44.84	42
39	Indian Institute of Engineering Science and Technology, Shibpur	27.57	39	41.28	73
40	Indian Institute of Science Education & Research, Kolkata	27.13	41	44.38	44
41	Annamalai University	26.87	42	38.59	92
42	Pondicherry University	26.33	43	42.7	59
43	Visva Bharati University	25.23	46	48.19	31
44	S.R.M Institute of Science and Technology	25.07	47	43.07	55
45	Indian Institute of Technology Ropar	24.68	48	47.84	32
46	Sri Venkateswara University	24.43	49	41.48	68
47	AMITY University	23.36	50	39.17	86
48	Bharath Institute of Higher Education & Research	23.12	51	46.45	35
49	Sathyabama Institute of Science and Technology	22.17	53	41.3	72
50	National Institute of Technology Surathkal	21.43	55	41.8	65

Sl.No	Name of Institutions	RPC Score	RPC Rank	Overall Score	NIRF Rank
51	Indian Institute of Technology Bhubaneswar	20.92	57	41.75	66
52	Osmania University	20.56	58	45.52	38
53	Mysore University	20.1	61	42.83	57
54	Indian Institute of Technology (Banaras Hindu University), Varanasi	19.35	63	41.37	70
55	Indian Institute of Technology Patna	19.13	64	39.87	83
56	Andhra University	18.59	66	41.38	69
57	Indian Institute of Science Education & Research, Bhopal	18.21	67	37.32	98
58	Indian Institute of Science Education & Research, Mohali	17.55	71	43.27	52
59	National Institute of Technology Warangal	17.53	72	40.05	82
60	Indian Institute of Technology Gandhinagar	17.34	74	40.48	78
61	Siksha 'O' Anusandhan University	17.17	75	46.72	33
62	Gauhati University	16.84	77	44.42	43
63	Punjab Agricultural University, Ludhiana	16.51	79	44.99	40
64	Indian Institute of Technology Mandi	16.43	80	45.62	37
65	Kerala University	14.62	88	43.95	47
66	PSG College of Technology	14.34	89	39.07	88
67	National Institute of Pharmaceutical Education and Research, Hyderabad	14.3	90	42.74	58
68	Sri Ramachandra University	14.1	92	42.46	61
69	Sri SivasubramaniyaNadar College of Engineering	14.02	94	40.31	80
70	Indian Institute of Management Ahmedabad	13.85	98	54.27	17
71	Kurukshetra University	13.44	100	38.26	95
72	Bharati Vidyapeeth	12.95	103	38.73	90
73	Kalinga Institute of Industrial Technology	12.75	105	40.47	79
74	Tamil Nadu Agricultural University	12.56	108	48.84	28
75	Indian Institute of Management Bangalore	12.47	109	49.26	25
76	North Eastern Hill University	11.83	114	40.51	77

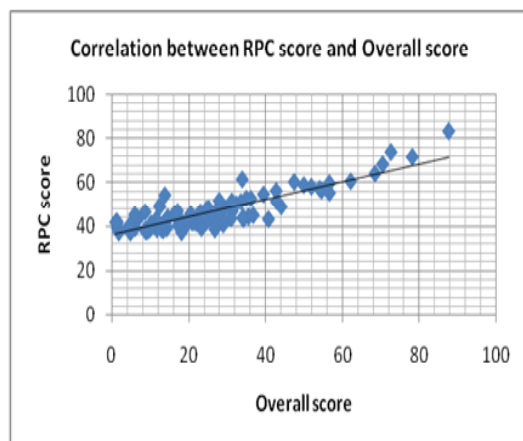
Sl.No	Name of Institutions	RPC Score	RPC Rank	Overall Score	NIRF Rank
77	Saveetha Institute of Medical and Technical Sciences	11.81	115	38.68	91
78	Indian Institute of Space Science and Technology	11.63	119	43.06	56
79	Jagadguru Sri Shivarathreeshwara University	10.32	124	41.18	74
80	Guru Angad Dev Veterinary & Animal Sciences University	10.08	125	40.1	81
81	Banasthali Vidyapith	9.99	127	38.74	89
82	Shiv Nadar University	9.43	132	37.95	96
83	Symbiosis International University	8.92	137	37.67	97
84	Calicut University	8.81	139	38.45	93
85	Homi Bhabha National Institute	8.75	140	46.45	35
86	Indian Institute of Management Lucknow	6.94	151	43.35	51
87	TATA Institute of Social Sciences	6.59	158	43.71	49
88	Tamil Nadu Veterinary & Animal Sciences University	6.36	162	42.48	60
89	Indian Institute of Management Kozhikode	6.11	166	39.2	85
90	Indian Institute of Management Calcutta	6.04	169	45.17	39
91	Anand Agricultural University	5.89	172	42.26	62
92	Mizoram University	5.27	178	38.36	94
93	Dr. D. Y. Patil Vidyapeeth Pune	4.9	187	40.59	76
94	KLE Academy of Higher Education and Research	4.9	187	37.25	100
95	Dr. Y.S.Parmar University of Horticulture & Forestry	4.39	198	39.54	84
96	Rajiv Gandhi Indian Institute of Management	1.89	263	37.28	99
97	Indian Institute of Crop Processing Technology	1.56	285	39.15	87
98	Indian Institute of Management Kashipur	1.47	290	41.36	71
99	Indian Institute of Management Udaipur	1.38	294	42.15	63
100	Indian Institute of Management Tiruchirappalli	1.09	312	41.73	67



Table-2 shows that the overall score and RPC score almost go parallel for the top ten institutions. For others the scores vary slightly. The majority of the institutions (71) that come within top hundred on the basis of RPC rank have also come within top hundred in the overall score. It shows that RPC is an important factor determining the institutions rank in the NIRF. 29 institutions that had higher RPC were excluded from the top hundred on the basis of parameters other than RPC.

#### 6.4 RPC Score and Correlation

The correlation coefficient (a value between -1 and +1) shows how strongly two variables are related to each other. The CORREL function in Microsoft Excel was used to find out the correlation coefficient between RPC score and overall score. Figure-1 shows the correlation between RPC score and overall score.



**Figure-1 Correlation chart**

A significant correlation coefficient 0.864 with linear correlation was obtained. The high correlation implies the validity of RPC score in the assessment of ranking of universities.

#### 7. Conclusion

The study analysed the role of scholarly communication in Institutional ranking. It was found that scholarly communication is an important factor that influences the overall ranking of an institution. All ranking agencies give importance to the number of documents as well as number of citations received. Library and information science professionals can contribute their service to increase the research output of the members of their institution by several means. Workshops and seminars can be offered on research tools and scholarly writing. Author workshops can be arranged in association with publishers. Tutorials on databases and e-journals can be given to introduce electronic resources to users.

#### References

1. Buena-Casal, G., Gutiérrez-Martínez, O., Bermúdez-Sánchez, M. P., & Vadillo-Muñoz, O. (2007). Comparative study of international academic rankings of universities. *Scientometrics*, 71(3), 349-365.
2. De Silva, P. U., & Vance, C. (2017). *Scientific Scholarly Communication: The Changing Landscape*. Springer.
3. Gupta, B. M. (2010). Ranking and performance of Indian Universities, based on publication and citation data. *Indian Journal of Science and Technology*, 3(7), 838-844.
4. Herring, S. C. (2009). Web content analysis: Expanding the paradigm. In *International handbook of Internet research* (pp. 233-249). Springer Netherlands.

5. Huang, M. H. (2012). Exploring the h-index at the institutional level: A practical application in world university rankings. *Online Information Review*, 36(4), 534-547.
6. NIRF India rankings-2017, Available at: [https://www.nirfindia.org/Docs/Ranking\\_Methodology\\_And\\_Metrics\\_2017.pdf](https://www.nirfindia.org/Docs/Ranking_Methodology_And_Metrics_2017.pdf)
7. Stack, M. (2016). *Global university rankings and the mediatization of higher education*. Springer.
8. The QS world rankings methodology (2017) Available at: <https://www.topuniversities.com/qs-world-university-rankings/methodology>
9. World University Ranking 2016-17 (2017) Available at: <https://www.timeshighereducation.com/world-university-rankings/methodology-world-university-rankings-2016-2017>

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