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NIRF India Rankings 2020: Analyzing the Ranking Parameters and Score of Top 100 Universities

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ABSTRACT

National Institutional Ranking Framework (NIRF) was launched on 29 September 2015 by the Ministry of Human Resource Development, Government of India to rank the academic & research institutions across the country. The NIRF E-release of India Ranking 2020 was held on 11th June 2020. The present study analyses the top 100 Universities in terms of visualisation of data, the relationship of ranking with the parameters, and the relations among these parameters. Results of the study indicate that the Teaching, Learning & Resources (TLR) score for all the universities was almost similar while Research and Professional Practice (RP) score had a considerable variation and played a significant role in ranking by having a positive linear correlation with the total score with the value of R^2= 0.746. RP also has a strong correlation with the Peer Perception (PR) of the university. The average library expenditure of top-10 universities was 9.45 crore per annum. It was also found that library expenditure has a positive correlation with RP and the universities with higher research productivity also have a more outstanding quality of publication in terms of citations.

Keywords: NIRF; Ranking; Universities; Research productivity; Ranking of universities; Library expenditure

1. INTRODUCTION

University ranking was initially started by the U.S. at the beginning of the 20th century, and the ranking of institutions was first time published by US News and World Report in 1983 in the USA.[1] These university rankings play a significant role in creating perceptions about the universities and works as a marketing instrument for them. Boulton[2] viewed that the ranking of a University influences the perception about the university and funding and project priorities of government and other organisations. Several universities focus on occupying a good ranking because a good ranking gives good publicity to the institution.[3] The main objective of a ranking of the institute is to improve the quality of teaching, learning, and research. All over the world, various agencies provide a ranking at the national and international levels.

In India, many accreditation agencies work to improve the quality of teaching, learning, and research. Some central accreditation bodies of India are NAAC, NBA, BCI, UGC, MCI, AICTE, and DCI, which assess the institute and give accreditation in a specific discipline. Many non-academic media such as newspapers, magazines, etc. that also publish university ranking from time to time, but the reliability of these ranking are questioned because only a few universities participate in it, and the primary purpose of these ranking is the publicity of universities for the admission campaign.[4] To overcome these challenges, with the primary aim to provide Indian universities a competitive environment[5], the National Institution of Ranking Framework (NIRF) was launched by MHRD, Govt. of India in 2015 for the evaluation of Indian institutions, based on the country centric parameters for inclusive and accessible education to encourage the quality.[6] A methodology was designed to rank the institution across India on the recommendations of the Core Committee constituted by the MHRD. The first ranking was released on 04th April 2016 at Vigyan Bhavan, New Delhi. In 2017, some significant changes were made in a few sub-parameters; however, the main ranking parameters were not revised. A common overall rank was given to the large Institutions; however, discipline-specific rank was also given. From 2016 onwards, every year, the NIRF ranking is released by the MHRD, Govt. of India year. In the current year, the ranking was e-released on 11th June 2020, and the present study is an attempt to analyse the top 100 ranked Universities of NIRF 2020.

1.1 NIRF Ranking Criteria

In the NIRF ranking, the performance of an institution is evaluated by five parameters, and each parameter has been given a score of 100 by the sub-parameters of these parameters. The five parameters are[7]:

- Teaching, Learning & Resources (TLR),
- Research and Professional Practice (RP),
- Graduation Outcomes (GO),
- Outreach and Inclusivity (OI) and
- Perception (PR)

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The weighted average of these parameters towards the NIRF score indicates that the TLR and RP have a contribution of 30 per cent each, GO has a contribution of 20 per cent, while OI and PR have a contribution of 10 per cent each in the total score. After calculating the weighted average, the scores are arranged in descending order, and the ranking is provided to them.

1.2 Significance of NIRF Ranking

The government has the ambition to mark Indian higher educational institutions in top world universities; hence NIRF was established, which was driven from the concept of QS (Quacquarelle Symonds) world ranking[8]; however, it was modified based on Indian educational institution's environment.

The ranking is calculated based on certified data given by the institutions, and even after receiving the certified data, "the data is checked regarding the data validation that has built-in."[9] NIRF score is a relative score, not an absolute like an accreditation score. The ranking is provided each year, and all the institutes are invited to participate in the NIRF ranking by registration through the NIRF portal, whereas accreditation is not provided to all the institutions, and the evaluation process takes place in five years. Stakeholders are concerned to know whether the performance of an institution is rising or falling each year.

1.3 Studies on NIRF Ranking

Some researchers have conducted studies on different aspects of NIRF Ranking. A study by Sheeza, Mathew & Cherukodan[10] identified that the parameters deciding the ranking in NIRF are at par with world ranking systems like 'Times World University Ranking' and QS ranking. According to Srimathi& Krishnamoorthy[4], the Times World University Ranking has a significant emphasis on research and citation, while the QS Ranking is more emphasised on academic reputation and employer reputation. Mukherjee[11] identified that the quality of research reflects in international databases is the indicator of the research performance of an institute, and the top NIRF-Ranked universities have a major part of their publications indexed in the Scopus database. Kumar, Balaji& Monika[12] found that the major parameter that influences the NIRF Ranking is research output. These authors also found a positive correlation between the capital expenditure of the institutions and the national ranking score. Institutes with higher NIRF ranking also have a higher score on ResearchGate.[13] The NIRF Ranking system has encouraged the universities to improve their research performance. Nassa et al[14] found an exponential growth in the publication count and citations of top-ranked universities in the last five years (2016-2020).

2. OBJECTIVES

The present study focus on the following objectives:

- To check the variation of various NIRF parameters among the top-ranked universities
- To identify the relation between the total score and the ranking parameters
- To check the relation between the quantity of publication with their quality (citations)
- To study the correlation between the different parameters
- To check the effect of library expenditure on Research and Professional Practice (RP).

3. METHODOLOGY

The study is focused on the top 100 universities in the NIRF-2020. The various parameters influencing the ranking of these top universities were analysed. The present study is a descriptive cross-sectional research in nature, in which the data was collected from the official website of NIRF. After the collection of the data, it was subjected to analysis by using SPSS-21 and Excel. This study would be helpful for the institutions to target the key parameters to occupy a better ranking and for students to make a decision for engaging with an institution.

4. ANALYSIS AND DISCUSSION

4.1 Parameters that Determine the Ranking of the Universities

The NIRF ranking is based on the weighted sum of the score of five parameters. Table 1 shows the descriptive statistics of these parameters defining the ranking. It is observed that TLR and OI have the most concentrated scores, with 9.14 and 8.14 as SD values around the mean scores of 61.49 and 56.86. Meanwhile, RP and Perception have the least mean scores of 24.18 and 31.08, and these two parameters also have a great amount of randomness in score concerning their mean score; the value of sigma for RP is 14.93 and 14.02 for perception. GO got the highest mean score (69.28), and its minimum score is also higher than other parameters. The maximum score of 100 is only in two parameters- GO and Perception.

Table 1. Descriptive statistics of parameters

Parameter	N	Min.	Max.	Mean	Std. Deviation
TLR	100	39.83	82.40	61.49	9.14
RP	100	2.82	92.16	24.18	14.93
GO	100	45.02	100.00	69.28	11.04
OI	100	40.34	76.16	56.86	8.14
Perception	100	2.18	100.00	31.08	14.02

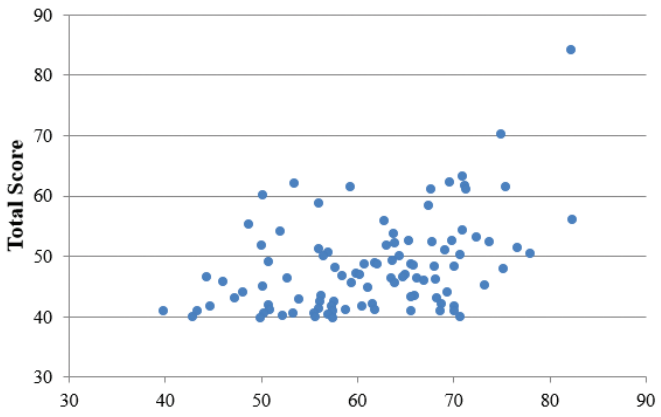

Figure 1. Teaching, learning & resources vs. Total score.

4.2 Relation Between the Parameters and the Total Scores Obtained by the Universities

Figure 1 shows that there is no correlation between TLR and the total score obtained by the universities. TLR score is distributed around the mean score (48.35) with minor deviation from the mean score throughout all the universities' total score, which is represented by a straight line (TLR=48.35) parallel to the x-axis. When looked right closely, it is observed that there is a dense distribution of universities around the mean of the total score (61.49). So it could be said that by looking at the TLR of a university, one can't predict the overall performance of that university as the TLR of the top 100 universities is nearly the same, and there is the least divergence from the mean score.

The association between the RP score and total score obtained by the universities is analysed by the scatter plot (Fig. 2) where the RP is taken as an independent variable on the x-axis and the total score as a dependent variable on the y-axis. Figure 2 shows that there is a linear, positive correlation between RP and the total score obtained by the universities. The relation between the two is represented by a linear regression equation y=37.61+0.44*x with a strong fit of R^2=0.746, where x and y represent the RP and total score, respectively. That means in 75 per cent of the universities, and enhancement of one point in RP causes an increment of 0.44 in the total score. Thus, it can be concluded that the universities with higher RP scores get a higher total score indicating that RP has a significant role in obtaining a good rank.

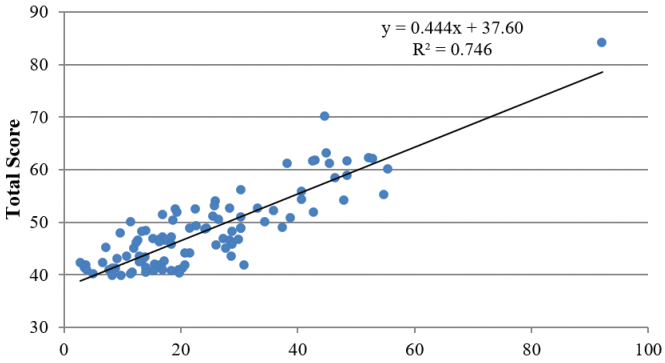

Figure 2. Research and professional practice vs. Total score.

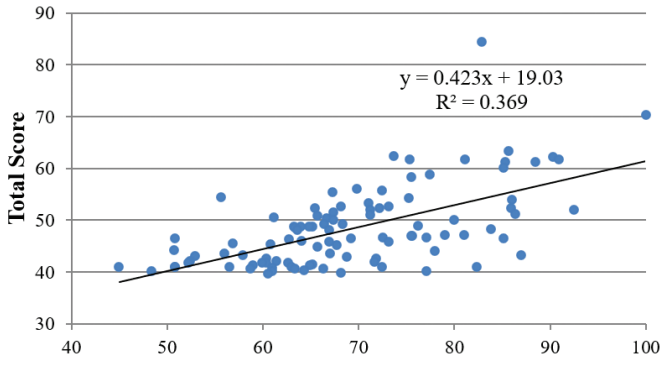

Figure 3. Graduation outcomes vs Total score.

The scatter plot in Fig. 3 indicates the association between the Graduation Outcomes (GO) and the total score obtained by the top-100 universities with GO on the x-axis (independent variable) and the total score on Y-axis (dependent variable). The relation between the total score and GO is shown by the linear regression equation y= 19.04 + 0.42x (x and y stand for the GO and total score respectively) with the R^2 = 0.37, which means there is a weak association between the GO and total score as the linear regression equation is applicable for only 37 per cent of the universities. The value of GO is scattered throughout the graph with respect to the total score obtained by the university. Thus, we can say that universities with higher GO scores tend to receive a good total score (rank) but need not necessarily always have a higher total score.

The association between the two variables (OI and total score) is shown through a scatter plot in Fig. 4, where OI (Outreach and Inclusivity) is represented on the x-axis as an independent variable and the total score on the y-axis as the dependent variable. It is observed from the graph that there are scattered points that represent the OI and the total score of those universities, indicating that there is no significant relationship between the OI and the total score obtained by a university. So, one can't predict the rank of a university by analyzing the OI performance of that university.

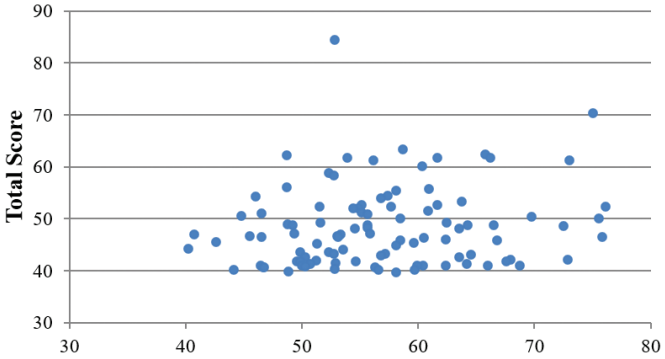

Figure 4. Outreach and inclusivity vs. Total score.

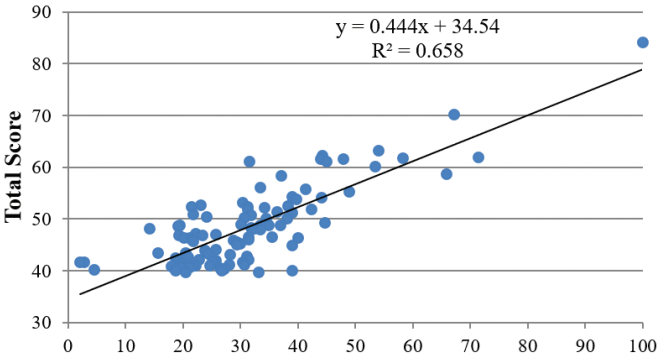

Figure 5. Peer perception vs. Total score.

As regards to Perception score, it is noticed from Fig. 5 that perception has a positive, perfectly linear correlation with the total score, and it is found that the relation between the perception and total score is represented by the linear regression equation y= 34.54+0.44*x (x and y represents the perception and total score respectively) with a fit of R^2 =0.658. It can be seen that the universities having a good Peer Perception tend to have a good NIRF rank. Thus, it can be assumed that to have good total score in NIRF ranking, the universities should have a focus on improving their public image which is reflected through Peer Perception in ranking parameters.

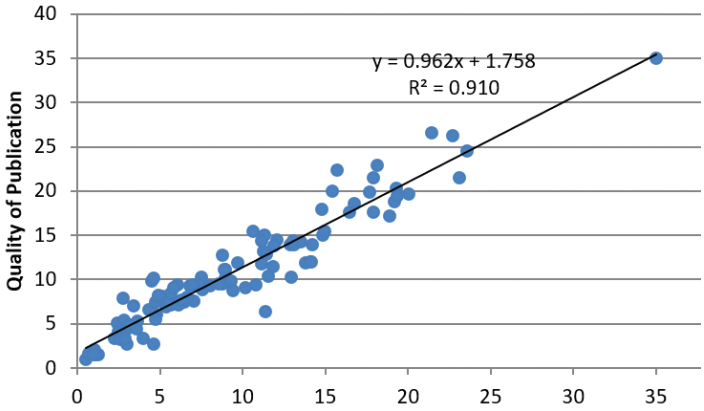

Figure 6. Publication v/s quality of the publication.

4.3 Relation Between Number and Quality of the Publication

The association between the quantity and quality of the publication is analysed by a scattered plot graph (Fig. 6) in which publication score by an institution is on the x-axis as an independent variable, whereas publication-quality score (citation value has been used as a measure of the quality of publication[15]) on the y-axis. It shows that there is a strong linear positive correlation between the number of the publication produced to the quality of the publication, the relation between the two is represented by the linear regression equation y = 1.76 + 0.96*x have b=0.96 with a highly fit of line R^2=0.91. In 91 per cent of cases, the quality of the publication is increased by 0.96 when the publication count is increased by one. Here, the publication-quality score is mainly emphasizing the citations received by the publication in the last three years and citations received in the top 25 percentile journals. The plotted graph makes evidence that the number of the publication produced is directly proportional to the citation received.

Table 2. Correlation between parameters

		TLR	RP	GO	OI	Perception
TLR	Pearson Correlation	1	.075	-.067	.232*	.177
	Sig. (2-tailed)		.459	.511	.020	.079
	N	100	100	100	100	100
RP	Pearson Correlation	.075	1	.441**	-.079	.741**
	Sig. (2-tailed)	.459		.000	.436	.000
	N	100	100	100	100	100
GO	Pearson Correlation	-.067	.441**	1	.033	.456**
	Sig. (2-tailed)	.511	.000		.742	.000
	N	100	100	100	100	100
OI	Pearson Correlation	.232*	-.079	.033	1	.021
	Sig. (2-tailed)	.020	.436	.742		.834
	N	100	100	100	100	100
Perception	Pearson Correlation	.177	.741**	.456**	.021	1
	Sig. (2-tailed)	.079	.000	.000	.834	
	N	100	100	100	100	100

** Correlation is significant at the 0.05 level (2-tailed)*
*** Correlation is significant at the 0.01 level (2-tailed)*

4.4 Correlation Between the Parameters

Table 2 shows the correlation between the different parameters that decide the total score for ranking, and it is found that there is a correlation (r=0.741) between the RP and Perception at a significance level of 0.01. The correlation between RP and GO is 0.441, and it is 0.456 between GO and Perception at a significance level of 0.01.

4.5 Relation Between Library Expenditure and RP

Table 3 provides information about the total and average expenditure of the top 100 universities. The average library expenditure of the top-100 universities was found to be 4.52 crore per annum. It was also observed that the average library expenditure of top-10 universities was 9.45 crores per annum, which is a comparatively greater amount than the rest of the universities. Only 24 universities have more library expenditure than the average library expenditure and among these only 12 universities spend more than 10 crores rupees per annum as library expenditure. Among the top 10 universities, Amrita Vishwa Vidyapeetham has the maximum library expenditure (18.29 crore) followed by Manipal Academy of Higher Education (16.21 crores), Indian Institute of Sciences (15.35 crores), Calcutta University (14.15 crores) and Jadavpur University (11.81 crores). These five universities have more library expenditure than the average library expenditure (9.45 crores) of the top-10 universities. Homi Bhabha National Institute, ranked 14th in NIRF ranking, has the maximum library expenditure (44.89 crores) among all the universities.

Pearson correlation was used to investigate the relationship between the library expenditure of top-100 NIRF ranked universities and RP score of these universities. The average library expenditure of the top-100 universities was 4.52 crore meanwhile the mean score of RP score was 24.18. Table 3 gives the correlation between library expenditure and research and Professional Practice (RP). It is observed from Table 3 that there is a positive, moderate correlation between the library expenditure and RP with r equal to .315 at the significant level of 0.01. This association between the library expenditure and RP shows that when the amount of library expenditure increases, then scholarly output is also increased in those universities. Those universities which have good library expenditure tend to produce not only good quality of research but also occupy a top rank in the NIRF ranking.

5. CONCLUSION

The analysis of NIRF India Ranking 2020 indicated that among the top 100 universities, more than half are situated in South India. The

Table 3. Library expenditure profile

Expenditure range	Number of libraries	Total expenditure	Average expenditure
Within 1 crore	23	110481630	4803549.13
1-2 crore	20	285559541	14277977.05
2-3 crore	13	303730092	23363853.23
3-4 crore	10	349711407	34971140.7
4-5 crore	10	446332670	44633267
5-10 crore	12	867677190	72306432.5
More than 10 crore	12	2153462352	179455196
Total	100	4516954882	45169548.82

Average library expenditure of top-10 universities in NIRF ranking= 94485660.

Table 4. Correlation between library expenditure and RP

		Library expenditure	RP
Library expenditure	Pearson correlation	1	.315**
	Sig. (2-tailed)		.001
	N	100	100
RP	Pearson correlation	.315**	1
	Sig. (2-tailed)	.001	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

government-funded universities have grabbed the maximum slots in comparison to the private-funded universities among the top 100 universities. The overall performance of the universities does not have a significant strong relation with Teaching, Learning & Resources (TLR), Graduation Outcomes (GO), and Outreach and Inclusivity (OI). TLR score for all the universities is almost similar with the least deviation from the mean score and correlation was not found between TLR score and total score. This indicates that almost all the top universities have good resources supporting teaching and learning. The TLR score, being nearly same for all the top 100 universities, doesn't influence the ranking positions of the universities. The IO score also doesn't have a significant relation with the total score, so prediction of ranking based on IO score is not possible. A weak association was found between GO and total score indicating that GO can have some effect on ranking position of universities but not in all cases.

The two parameters which influenced the ranking position of the universities were Research and Professional Practice (RP) and Perception. It was observed that the RP and the Perception score of the university have the most deviation from the mean score. Research is an integral part of all the universities and the universities with higher RP scores outperformed other universities in the NIRF ranking. The universities should focus more on their research and professional activities in order to obtain better rank in future. RP and Perception have a significant correlation with the ranking of the university. The universities having a good RP also have a good perception. A more interesting fact is seen between the publication production and quality of the publication; the institutions producing more publications receive significantly more citations. The average library expenditure of the top-10 universities was 9.45 crore per annum which is nearly double than the average library expenditure of top-100 universities (4.52 crore). 12 universities had library expenditure of more than 10 crore per annum and among these five were in the top-10 list. The library expenditure has a significant positive correlation with the research output of an institution. An increase in library expenditure has a positive effect on the scholarly output, thus influencing the ranking of that institution. A correlation was also obtained between RP & Perception, RP & GO and GO & Perception indicating that these three parameters are inter-related to each other.

The present study indicates that the key factors that influence the NIRF ranking of an institution are Research and Professional Practice (RP) and Peer Perception, and both these factors are highly positively correlated with each other. These two parameters have influenced the ranking of the top-100 universities the most and the aspiring universities which are looking for a good NIRF rank in future should pay more attention to these parameters along with the other parameters. It was also found that the universities with a good amount of library expenditure have scored well in research and professional practice. Hence it could be summarised that those universities which spend a good amount on library expenditure as input received a good score in research and got well peer perception, which transformed a university into a well-known ranked university. By analyzing the NIRF scores, the institutions will be able to identify the areas on which they can focus more in the future, thus enhancing their quality in particular and that of the country in general.

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His contribution in the study has been in introduction, data analysis and writing of the manuscript.

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In this study he has contributed towards data extraction and references part of the paper.

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His contribution to the study is towards selection of the topic, framing objectives and writing conclusion part of the paper.