Detailed Review of National Institute Ranking Framework (NIRF) India Rankings including Uncertainty and Sensitivity

Mohammad Ghulam Ali

The Higher Education System in India is the world's third largest in terms of students, which is just next to China and the United States. Quality teaching, learning and research is the primary issue in Higher Education System. The Ranking and Accreditation process, both are considered as assessment tools, for quality assessment of Higher Education Institutions (HEIs) and both will give significant impact on the performance outcomes in-term of quality education and research. The quality of education and research will contribute to the sustainable development. In this research paper, a thorough systematic and sequential study of NIRF India Rankings is done considering ranking results up-to year 2020. The paper has also discussed in detail about the ranking process being undertaken and various ranking parameters which are considered in the NIRF Rankings framework for the overall category during the year 2020. The research article is mainly focused on uncertainty and sensitivity issues including some self-explanatory tables which are based on in-depth analysis of scores published on the NIRF public domain for the year 2020 and with a very positive approach in favour of students and their parents, Institution Policy Makers and the Academic Leaders. Some flaws in the rankings have also been observed based on the published documents and educational news. Some additional measures have also been suggested to consider them in the forthcoming years so that the existing ranking framework will become more robust and stable and finally a paper is summarized. Some abbreviations are also included at last of the article.

INTRODUCTION

Post-independence India, the quality of education was considered a key area that will play a significant role in fostering the country's economic growth and the nation's future. Then the Higher Education took a drastic turn, the national leaders were determined in their aim of making India more strong and stable by enriching its human resource and higher education became the top priority of the government. Then, a comprehensive review of Higher Education was felt necessary of its all areas to revamp the whole system. The goal was to make the higher education system more relevant to the needs of an emerging nation. The Radhakrishnan Commission (also known as the University Education Commission) was the first commission (in 1948-49) in India after independence to study the condition of the universities. The Radhakrishnan Commission had recommended to set up the University Grants Commission (UGC) as a link between the central government and the universities. The evaluation of quality of higher education in India has been emphasized by the National Policy of Education 1986 and the repaired reformation of the Programme of Action (POA) 1992. Subsequently, recognizing the importance of Institutional assessment, the National Assessment and Accreditation Council (NAAC) had been established in 1994 by the University Grants Commission (UGC) (Gupta et.al., 2021).

ali@hijli.iitkgp.ac.in, orcid.org/0000-0002-6012-6380, Vinod Gupta School of Management, Indian Institute of Technology Kharagpur. Kharagpur, West Bengal, India

Thereafter, NIRF India Ranking System has been emerged on 29th September 2015 to rank the Higher Education Institutions (HEIs) and to promote a healthy competition among the Institutions to sustain and to enhance their quality and to create conditions for assuring world class quality along-with good governance in higher education.

It is observed from various published documents, every academic ranking agency uses a certain set of parameters to compute overall score for each participating college/institution/university and then they are ranked based on the scores they have obtained. Mostly, International Rankings are based on educational and research excellence but, NIRF has considered broad parameters of assessments. However, the two parameters; Research and Professional Practice (RP) and Perception (PR) are influencing factors in obtaining the better ranking position in the NIRF India Rankings. This is a matter of concern. The Times Higher Education World University Ranking has a significant emphasis on Research and Citation (Ali, 2022), while QS World University Ranking is more emphasized on Academic and Employer reputation (Ali, 2022). But we expect from each ranking agency to cover a broad parameters and each parameter must be equally influential in obtaining a good rank.

In this research paper, some discussions have been made on the NIRF India ranking system and identified some flaws based on survey of the various published documents and educational news, some observations have also been made and also some additional measures are proposed to consider in the forthcoming years to making the exiting ranking framework more stable and robust. These issues are discussed below at page 9.

The paper is organized as follows:; section 2; talks about the emergence of NIRF India Rankings, section 3; talks about the dimension and strength of NIRF India Rankings and it contains 13 sub-sections, section 4 discussed on method used to write this research article and it contains 6 sub-sections section 5; talks about the uncertainty and sensitivity issues identified and it contains 1 section, 2 sub-sections and 5 tables, section 6; talks about the flaws in the existing Ranking Framework, observations and suggestive measures and it contains 3 sub-sections, section 7; declaring the acknowledgement and conflict of interest, section 8; describes limitation of study, and finally section 9; concludes the paper.

It is important us to understand why University Rankings are needed. According to (Gadd et.al, 2021) students use them to get help in selecting where to study, faculty use them to select where to work, universities use them to market themselves, funders use them to select to whom to fund, and governments use them to set their own ambitions.

Emergence of NIRF India Rankings

Contrary Aspect of Emergence

Some contrary aspects have been emerged during the formation of the NIRF Rankings. Please see the details as it is mentioned by (Pushkar, 2015).

Dominant Aspect of Emergence

According to the All India Survey of Higher Education (AISHE) report 2018–19, India has 993 Universities, 39,931 Colleges and 10,725 Stand Alone Institutions. In addition, there is one central open university, fourteen state open universities and one state private open university. These together cater to the needs of around 37.4 million students admitted for higher education[32]. Out of these institutions, only a few top ones find a place in global rankings and most of the other institutions remain unrepresented. Such top institutions are mostly IITs, IISc, IISERs, a few central and state universities and some private institutions. The total number of all such institutions that are represented in at least one international ranking taken together stands at around 30, not even 1% of the total higher education institutions (HEIs) in the country. The under representation of Indian institutions and the proven inability of global rankings in giving due representation of national HEIs pressed the need for a ranking specific to Indian institutions. It was expected that a ranking scheme designed specifically for India will not only help in understanding the true status of higher education in India but also give Indian HEIs a reasonable measure of performance to improve upon[33]. The Government of India responded to this long-standing demand of academicians and policy researchers with the launching of a systematic framework for ranking of Indian HEIs in 2015 (Marisha, 2021).

Among above Universities, Colleges, and Stand Alone Institutions, 298 Universities are affiliating i.e. having Colleges, 385 Universities are privately managed, 394 Universities are located in rural areas, 16 Universities are exclusively for women, in addition to 1 Central Open University, 14 State Open Universities and 1 State Private Open University, there are 110 Dual mode Universities, which offer education through

distance mode also. There are 548 General, 142 Technical, 63 Agriculture & Allied, 58 Medical, 23 Law, 13 Sanskrit and 9 Language Universities and rest 106 Universities are of other categories from 962 Universities participated in survey (AISHE, 2018-19).

National governments have started ranking their institutions realizing the global trend. The Government of India introduced National Institutional Ranking Framework (NIRF) in 2015 under the Ministry of Human Resource Development (MHRD) to rank its higher education institutions. As ranking brings information about the quality of universities and higher education systems (Docampo, 2013), NIRF was considered for infusion of quality and clarity towards building world-class educational institutions in India (Aithal et al., 2016) and for creating a performance culture and prepare Indian Institutions for global rankings (Agarwal, 2017). NIRF published its first ranking in April 2016, evaluating 3,563 institutions in the country (Sheeja et.al., 2018).

Unfortunately, no HEIs in India figure in the top 100 of many of the above rankings and only very few IITs are figured in the rankings between 150 and 200. Keeping in this in mind, the MHRD, Government of India (GoI) has launched the 'National Institutional Ranking Framework (NIRF)' in 2016 to create a healthy competition among the HEIs in India and also to encourage them to develop their capabilities to compete in the global level (Mandhirasalam, 2018).

We observe that NIRF rankings has emerged due to the showing poor performance of our universities/colleges/institutions in the World University Rankings and therefore to strengthen their Institutions by participating in the NIRF rankings and then to obtain better positions in the World University Rankings.

There is one more reason in emergence of NIRF Rankings. Indeed, the impulse behind preparing *India Rankings 2016* was that the government was unhappy with the ranking parameters used by QS and THE (Pushkar, 2016).

Dimension and Strength of NIRF Ranking

NIRF Ranking Framework and Disciplines offered to Participate

The National Institutional Ranking Framework and the National Institutional Ranking System for the Higher Educational Institutions is considered as a novel performance evaluation system using our recently developed analysing framework called ABCD technique which is based on four constructs Advantages, Benefits, Constraints and Disadvantages (Balasubramani et.al., 2019).

The data consists of size-dependent and size-independent parameters, and also several components in terms of quantity and quality in a meaningful way. Finally, the NIRF model reduces the vast Higher Education Institutional data into a single score (Doshi, 2021).

NIRF ranking is now playing an important role in improving performance and quality of Academic, Research and both Institutions. The Ministry of Human Resource Development, Govt. of India now Ministry of Education has identified various criteria and parameters in context of better ranking coverage such as considering various academic programems as per the ranking framework, sanctioned approved Intake, admitted, graduated in minimum stipulated time, placed, highest median salary, opted for higher studies, PhD students enrolled and graduated, total students enrolled, outreach and executive development programmes, total faculty in position, financial resource (fund utilization in capital and operating expenditure), research publications and citations, Number of citations in top 25 percentile averaged over the previous three years. patents filed and granted, sponsored research projects and industrial consulting projects, facilities provided for disabled students, percentage of students male and female, percentage of students from within state, other states and other countries, percentage of women students and faculty, percentage of economically backward and socially challenged students, faculty members received highly reputed national/international awards/recognition from Central Government agencies and students received international awards, full tuition fee reimbursement from central/state/private bodies and from the Institute fund, is institution is accredited, perception (this parameter measures the perception of the institution among the public and the indicator values are obtained from surveys conducted among academic peers and employers) and finally social contribution through the participating Institution. All above said parameters are then categorized into a set of broad parameters as it is mentioned below. Reference: From online Data Entry Modules of the NIRF Indian Rankings overall discipline.

The National Institutional Ranking Framework (NIRF) which is being conducted by the Ministry of HRD now Ministry of Education, Govt. of India every year. All government and private funding Institutions are invited to participate in the ranking process. In the year 2020, the NIRF Rankings System has allowed

Institutions from all over India to participate in different disciplines such as University, Engineering, Management, Pharmacy, College, Medical, Law, Architecture and Dental. If any large Institution/University/College has more than one disciplines, then the data from all disciplines will be accumulated under the overall disciplines, scores will then be evaluated and accordingly rank will come out. However, in the first year of rankings results 2016, NIRF had considered only University, Engineering, Management and Pharmacy (India Ranking 2020, National Institutional Ranking Framework,).

The National Board of Accreditation (NBA) will continue to be the Ranking Agency on behalf of NIRF for 2020. National Institutional Ranking Framework used broad parameters; 1) Teaching, Learning and Resources, 2) Research and Professional Practices, 3) Graduation Outcomes, 4) Outreach and Inclusivity and, 5) Perception. Ranking methodology is based on a set of metrics for evaluating the score and rank of any Institution/University/College. The parameters are agreed/approved by the Core Committee. A table appended below is showing Summary of Ranking Parameters and Weightages- 2020 (India Rankings 2020, National Institutional Ranking Framework).

Table 1: Summary of Ranking Parameters and Weightages under overall category

(Overall) Sr. No.	Parameter	Marks	Weightage
1	Teaching, Learning & Resources	100	0.30
2	Research and Professional Practice	100	0.30
3	Graduation Outcomes	100	0.20
4	Outreach and Inclusivity	100	0.10
5	Perception	100	0.10

Each broad parameter is further expanded into a set of sub-heads. Each broad head has overall weight assigned to it. Within the broad head, each sub-head has also appropriate weight distribution. The detailed ranking parameters are given below (India Rankings 2020, National Institutional Ranking Framework).

Table 2: Detailed Ranking Parameters and Weightages under overall category

S.No.	Parameters	Marks
1.	Teaching, Learning & Resources (TLR) Ranking weight: 0.30	100
	A. Student Strength including Doctoral Students(SS): 20 marks	
	B. Faculty-student ratio with emphasis on permanent faculty (FSR): 30 marks	
	C. Combined metric for Faculty with PhD (or equivalent) and Experience (FQE): 20 marks	
	D. Financial Resources and their Utilization (FRU): 30 marks	
2.	Research and Professional Practice (RP) Ranking weight: 0.30	100
	A. Combined metric for Publications (PU): 35 marks	
	B. Combined metric for Quality of Publications (QP): 35 marks	
	C. IPR and Patents: Published and Granted (IPR): 15 marks	
	D. Footprint of Projects and Professional Practice (FPPP): 15 marks	
3.	Graduation Outcomes (GO) Ranking weight: 0.20	100
	A. Metric for University Examinations (GUE): 60 marks	
	B. Metric for Number of Ph.D. Students Graduated (GPHD): 40 marks	
4.	Outreach and Inclusivity (OI) Ranking weight: 0.10	100
	A. Percentage of Students from Other States/Countries (Region Diversity RD): 30 marks	
	B. Percentage of Women (Women Diversity WD): 30 marks	
	C. Economically and Socially Challenged Students (ESCS): 20 marks	
	D. Facilities for Physically Challenged Students (PCS): 20 marks	
5.	Perception (PR)* Ranking weight: 0.10	100
	A. Peer Perception: Academic Peers and Employers (PR): 100 marks	

*However, for universities in the PR parameter, 70% weight is given to Peer Perception and 30% to Accreditation.

Basis of Scores Computation

A suitable metric is then proposed based on this data, which computes a score under each sub-head. The sub-head scores are then added to obtain scores for each individual head. The overall score is computed based on the weights allotted to each head. The overall score can take a maximum value of 100. The institutions can then be rank ordered based on their scores (India Rankings 2020, National Institutional Ranking Framework).

Eligibility for Overall and Discipline Specific Rankings

In the year 2020, all candidate institutions, *independent of their discipline* or nature (comprehensive or otherwise) will be given *overall rank[1]*, if they satisfy the criteria that they have a total of atleast 1000 student intake or enrolled students in UG and PG programs. Institutions will also be given a discipline specific rank as relevant. While score computations for the parameters are similar for both kinds of rankings (i.e., overall or discipline specific) on most counts, the weights are somewhat different on a few parameters, to take into account discipline specific issues. Rankings will be considered only for those institutions that have graduated at least three batches of students in full time UG or PG programs, where the duration is not less than three years for the UG programs and two years for the PG programs. Highly focused institutions with a single main discipline (Engineering, Medical, Law, Management, Pharmacy, Architecture or UG degree colleges in Arts, Science and Commerce, etc.) with less than 1000 total sanctioned approved intake or enrolled students will be given only a discipline specific rank. Undergraduate Teaching institutions (including degree colleges affiliated to a university) are also invited to participate. Open Universities and Affiliating Universities (whether State or Centre approved/funded) will not be considered for ranking. However, if these universities have a teaching or research campus of their own, they are welcome to participate with data pertaining only to their physical campuses. Data pertaining to their function as open or affiliating universities cannot be included in the submitted data (India Rankings 2020, National Institutional Ranking Framework).

Data Collection and Upload the submitted data on their own publicly visible website in the interest of transparency

In view of the absence of a reliable and comprehensive third-party Database that could supply all relevant information (as needed for computing the said scores), it is imperative that the institutions that are desirous of participating in the ranking exercise, supply the data in the given format that is being made available on the NIRF portal, before the last date specified for this purpose. The deadlines will be separately announced on the NIRF portal. It is required that the institutions upload the submitted data also on their own, publicly visible website in the interest of transparency. They should also provide an email address where they would receive comments and feedback. Institutions should pro-actively and objectively examine the comments and feedback received to effect corrections, if so warranted (within the time slot to be announced by NIRF on its website). All institutions have to mandatory host data submitted for India Rankings 2020 for a period of three years. Institutions who fail to post the data submitted to NIRF on their own, or those who do not have institution website, will be given initial notice and afterwards an appropriate action will be taken (India Rankings 2020, National Institutional Ranking Framework).

Physical checks on the institution records and audited accounts

NIRF has been empowered to take up physical checks on the institution records and audited accounts where needed, to ensure that the principles of ethical behavior are being adhered to. In case an institution is approached for carrying out any physical check, they are expected to co-operate. Non-cooperation may lead to debarring the institution from participation in the ranking exercise. NIRF, by itself or with the help of other suitably identified partner agencies will also undertake authentication of data, wherever felt necessary, and where feasible (India Rankings 2020, National Institutional Ranking Framework).

Source of Research, Patents Data

For some of the parameters (like Research, Patents etc.) the data will be populated from internationally available Data Bases. However, NIRF reserves the right not to use the data from any of these sources or include other sources, if so warranted. NIRF shall directly access data from these resources, or seek help from the resource publishers, as necessary (India Rankings 2020, National Institutional Ranking Framework).

Provision of modifying any of the metrics

NIRF also reserves the right to modify any of the metrics if it deems fit to do so in the interest of rationalization necessitated by the exigencies or the nature of the data encountered. Any changes so made will be notified at the time of announcing the rankings (India Rankings 2020, National Institutional Ranking Framework).

Errors and Correction Policy

All efforts will be made to display the raw data on the NIRF website after due processing by NIRF for cross-checking by the institution. This is the data on which rankings would be finally computed. It will be the Institution's responsibility to ensure that the data published by NIRF accurately reflects the submissions by it. The institution will also be invited to check out the data supplied by or taken from third sources. If the Institution does not give any comments or feedback within a specified period on the displayed data, it will be assumed that this data is accurate. No petitions for corrections will be accepted after the declared deadline, or

after the rankings have been announced. It is the responsibility of the Nodal officer to ensure that the data updated during data verification is correct. And if data updated is incorrect, Nodal Officer should send an email before rankings are announced. No such complaints will be entertained after the release of ranks. If it is found that an institution has deliberately manipulated the submitted data, causing erroneous rankings, NIRF will remove the institution from the ranking list and future rankings and publish a suitable note to this effect. If it is found that an institution has deliberately manipulated the submitted data, causing erroneous rankings, NIRF will remove the institution from the ranking list and future rankings and publish a suitable note to this effect (India Rankings 2020, National Institutional Ranking Framework).

Research and Professional Practice (RP)

RP carries 100 marks and a ranking weight of 0.30. The major share (70 per cent) of RP score comes from the number of publications and the number of citations over a period of three preceding years (using a common time window for data collection). For this data, NIRF depends on sources like Web of Science, Scopus, PUBMED, FT45, Indian Citation Index, Incite and SciVal country (Sheeja et.al., 2018).

Impact of scholarly output and ranking

The second parameter of NIRF "research and professional practice" (RP) measures scholarly output of institutions. RP is divided into four sub heads, namely, combined metrics for publications (PU); combined metrics for quality of publications (QP); IPR and patents filed, published, granted and licensed (IPR) and foot print of projects; and professional practice and executive development programs (FPPP). RP is measured as follows:

RP = PU(30) + QP(40) + IPR(15) + FPPP(15).

Hence, 70 marks out of 100 are calculated for the scholarly productivity. The authors attempted to study if universities with more RP score get top positions in NIRF country (Sheeja et.al., 2018).

Collaborators

National Board of Accreditation (NBA), 2) INFLIBNET Centre, Ahmadabad, 3) All India Council for Technical Education (AICTE), 4) University Grants Commission (UGC), 5) Academic Partners: Web of Science (Clarivate Analytics, formerly Thomson Reuters) and, 6) Scopus (Elsevier) and Indian Citation Index (Mandhirasalam, 2018).

Award for the well performer in NIRF

According to the former Education Minister, Mr. Javadekar said that "the educational institutions performing well in the annual ranking will be awarded with more funding or grants, enhanced autonomy and freedom of functioning and various benefits" (Pallikkutam, 2016).

Some of the benefits of NIRF Ranking are as below

NIRF is presently gives a birds-eye view on the performance and status of the universities/institutions/colleges participated. Following are some benefits for the participating universities/institutions/colleges showing good performance in the ranking; 1) are getting more funds, 2) are getting more autonomy, 3) increasing public trust, 4) increasing branding perception, 5) improving competitiveness and placing in the spotlight among pioneers, 6) attracting parents and students and, 7) boosting campus placement. In order to accelerate the process of quality education, Indian Government has come up with various important measure including policy on declaring certain (public and private universities/institutions/colleges) as 'Institutions of Eminence' based of their strength on certain criteria and expecting they are capable to obtain within the 100 Institutions index list in the World. The purpose of launching NIRF India Rankings is also to prepare them to obtain a better rank in the World rankings and helps Government to identify the top 10 public and private universities to fund and rise them for the world-class institutions.

Method

Theme of the Reserch Article

Quality teaching, learning and research is the primary issue in Higher Education System. The Ranking and Accreditation process, both are considered as assessment tools, for quality assessment of Higher Education Institutions (HEIs) and both will give significant impact on the performance outcomes in-term of quality education and research. The quality of education and research will contribute to the sustainable development. The same is also described in the abstract.

Systematic and Sequential Study of NIRF India Rankings

A thorough systematic and sequential study of NIRF India Rankings is done considering ranking results up-to year 2020. The paper has also discussed in detail about the ranking process being undertaken and various ranking parameters which are considered in the NIRF Rankings framework for the overall category.

Assessmnt of Uncertainity and Sensitivity Issues

The research article is mainly focused on uncertainty and sensitivity issues including some self-explanatory tables which are based on in-depth analysis of top 100 Universities/Institutions/Colleges scores obtained and published on the NIRF public domain for the year 2020 under the overall category and with a very positive approach in favour of students and their parents, Institution Policy Makers and the Academic Leaders.

Following steps have been taken to measure the Uncertainity and Sensitivity of ranks

Derived from scores obtained in different parameters by top 100 Institutions during NIRF Indian Rankings 2020; Minimum Scores, Maximum Scores, Median, Mean, Relative Contribution, Mean Relative Contribution and finally the Standadrd Deviation.

Surevy of published research documents and Education Newsletters and observed some flaws in the NIRF India Rankings

Some flaws in the rankings have also been observed based on the survey of published research documents and educational newsletters as much as it was possible.

Observations and Additional Measures may be Considered Suggested

Some additional measures have also been suggested to consider them in the forthcoming years so that the existing ranking framework will become more robust and stable.

Uncertainty and Sensitivity of Ranks: Relative Contribution and Standard Deviation

Results and Discussion

a) Availability of data and material

Data is publically available on https://www.nirfindia.org/2020/OverallRanking.html

b) Discussions on Uncertainty and Sensitivity of Ranks

The sensitivity of the ranking is based on the relative contribution of the indicators. The analysis of the relative contribution of the indicators to each university's score can provide useful information as to whether some indicators dominate the overall scores (Saisana et.al, 2008). The uncertainty and sensitivity of ranks have been previously used with a lot of success for the analysis of different university ranking methodologies (Zornić et.al., 2016); (Dobrota et.al., 2015).

Standard deviation of ranking gap values for universities indicate inconsistency of judgment and invalid and inaccuracy data used in the assessment. There are some differences among original weights and calculated relative contributions by uncertainty and sensitivity methodology' (Maričić et.al., 2016).

Standard Deviation Of University Ranking Gap: This indicates that there is bias data were used to predict the university ranking (Koto et.al., 2018).

c) *Three self-explanatory tables are appended below with analysis and outcomes MEAN RELATIVE CONTRIBUTION, RELATIVE CONTRIBUTION of each Institution and the STANDARD DEVIATION.*

Table 3: Mean Relative Contribution and Standard Deviation

SL.	No. of Insts.	INDICATORS	WEIGHT	MIN	MAX	MEDIAN	MEAN	MEAN RELATIVE CONTRIBUTION	STANDARD DEVIATION
1	101	TLR	0.3	44.31	82.87	64.38	64.1	0.38	8.71
2	101	RPC	0.3	4.93	92.16	30.34	34.19	0.19	18.22
3	101	GO	0.2	43.61	100	68.36	71.03	0.28	10.27
4	101	OI	0.1	40.84	76.16	56.22	57.45	0.11	7.60
5	101	PR	0.1	0	100	14.79	21.99	0.04	22.07

In the above table, we observe that RPC and PR having strong influence over other parameters in obtaining a better rank and standard deviations are also not stable.

Based on the above results, we observe that universities/colleges/institutions with academic and research background are obtaining better ranks compared to purely academic background universities/colleges/institutions. This is due to the influence of RPC and PR under overall.

We can suggest, those lower ranked Institutions (with academic background only) under overall category hoever with good ranks in their own disciplines, should not participate under the overall category. In many

cases, rank will fall from their own disciplines to overall. This will create a confusion for the academic leaders, decision makers, Institutions, parents and students. Please see the tables 6 and 7 below.

Table 4: Relative Contribution of top 10

		Weightages				
2020	OVERALL [TOP 10]	0.3	0.3	0.2	0.1	0.1
		RELATIVE CONTRIBUTION				
Sl	Ranks Obtained	[TLR]	[RPC]	[GO]	[OI]	[PR]
1	1	0.29	0.32	0.21	0.07	0.11
2	2	0.29	0.33	0.20	0.06	0.12
3	3	0.30	0.32	0.19	0.08	0.11
4	4	0.29	0.32	0.20	0.07	0.11
5	5	0.27	0.32	0.23	0.08	0.11
6	6	0.30	0.30	0.22	0.07	0.11
7	7	0.32	0.28	0.24	0.09	0.07
8	8	0.33	0.20	0.29	0.11	0.08
9	9	0.30	0.29	0.25	0.09	0.06
10	10	0.34	0.22	0.28	0.09	0.07

Table 5: Relative Contribution of bottom 10

		Weightages				
2020	OVERALL [BOTTOM10]	0.3	0.3	0.2	0.1	0.1
		RELATIVE CONTRIBUTION				
Sl	Ranks Obtained	[TLR]	RPC]	[GO]	[OI]	[PR]
90	90	0.45	0.11	0.33	0.10	0.00
91	91	0.57	0.03	0.28	0.11	0.00
92	92	0.47	0.09	0.30	0.14	0.00
93	93	0.36	0.18	0.31	0.12	0.02
94	94	0.37	0.20	0.30	0.12	0.01
95	95	0.34	0.15	0.37	0.13	0.02
96	96	0.34	0.22	0.30	0.12	0.02
97	97	0.52	0.05	0.29	0.14	0.00
98	**98**	0.43	0.09	0.31	0.14	**0.03**
99	99	0.41	0.12	0.30	0.16	0.01
100	100	0.47	0.08	0.32	0.12	0.01
101	101	0.47	0.09	0.28	0.14	0.02

We find in the above two tables, there are some differences (either higher or lower to the originally weighted).

Table 6 NIRF 2020 University Vs. Overall Ranking Comparison

Sl.	Institutions	Rank in University Discipline	Rank in Overall Discipline
1	University 1	3	10
2	University 2	7	11

Table7 : NIRF 2020 Medical Vs. Overall Rank Comparison

Sl.	Institutions	Rank in Medical Discipline	Rank in Overall Discipline
1	Medical 1	27	91
2	Medical 2	7	11

Flaws in the existing Ranking Framework, Some Observations and Suggestive Measures

To begin with, it is important to understand that all university rankings systems have some flaws.

Flaws in the existing Ranking Framework

Improve the verification and data authentication, ensure and adapt dynamic changes in the parameter based on institutional profiles, introduction of h-index of institution (Srimathi et.al., 2020), the uncertainty and sensitivity issues are analysed above to check the stability of the ranking results produced by the NIRF India Rankings 2020. The results indicate that the rankings are volatile. The rankings of only top 10–15 institutions are found to be relatively stable while for most of the other institutions, the ranks assigned to them are found to be unstable. The results of the study give useful inputs to policy makers and concerned stakeholders to further improve the ranking methodology. It will also help to general audience, to understand better, up-to what extent they can consider the ranking results, engineering institutions occupy 7 out of top 10 positions under the overall rankings. Further, around 1/3rd of the institutions (36) in the overall rankings of the top 100 institutions are Engineering Institutions (Marisha 2021), disengagement: Disconnect is visible between the ranking and accreditation. Several universities have earned a National Assessment and Accreditation Council (NAAC) A Grade but figure poorly in the ranking system. NIRF should take into consideration both things (Mantha et.al., 2021), and There is also discrepancy in the data submitted to the NIRF and the data on the websites of these institutions (Flaws in the NIRF's Ranking, 2022).

Observations on NIRF Rankings

Paucity of World Class Research and Innovation is one of the serious concerns/issues/challenges for Indian Higher Education, and Indian HEIs need to accelerate their participation in the area of research and innovation to achieve good ranking / high accreditation (Gupta A et.al. 2021), the government may give more emphasis to allocate grants in various modes to the private institutions particularly in the area of research and development activities in which they are struggling as it is reflected in the rankings, there is a need to generate innovativeness among the students studying in the Indian HEIs. That is why, academic institutions have to bring innovations in the teacher- learning and teaching - learning processes and this will increase number of research publications, citations, patents and copyrights, every institution must check the accuracy and authenticity of data based on the ranking framework and the data definition provided to consider themselves before being used for the ranking purposes, any new consideration in the data boundary in any sub-head be properly communicated to the institutions in advance and, fine-tuning the survey questionnaires for the measurement of perception of the institutions in the sense of more reliability if there is any gap noticed.

Suggested for inclusion of additional parameters in the existing NIRF Ranking Framework

Following additional parameters with proper allocation of weightage to each may be considered in the existing ranking framework to make the framework more robust and stable:

Funding and financing in all different modes including income through commercialization and licensing, Spin-off and Start-up (excluding Sponsored Research and Industrial Consultancies as these two indicators are already covered), average tuition fees per academic year from all academic programmes (UG/PG/PhD) for Domestic and International students, consideration of International Faculty, international collaborations (proportion of an institution's total research journal publications that have at least one international co-author, proportion of an institution's total PhD guidance with at least one international co-supervisor and proportion of an institution's total Sponsored Research Projects with foreign collaborations), consideration of h-index of the institution and, adjustment of weightings in the sub-heads if necessary and adding or subtracting the sub-head(s) (to maximize the correlation), if required.

Acknowledgement and Conflict of Interest

Limitation of Study

The analysis and outcomes are based on considering the overall scores of top 100 Institutions under overall category of NIRF Indi Rankings. As much as possible, a survey on the published research documents and educational newsletters has been done.

Conclusion

In this research paper, a detailed study of NIRF India Rankings process has been made and also analyzed the scores of top 100 institutions under the overall category of NIRF 2020 results and some self-explanatory data in the form of tables (3,4,5,6 and 7) are included that will help the readers/audience/researchers/academic leaders/decision makers/Institutions/parents and students to understand the uncertainty and sensitivity issues while the NIRF is ranking the Institutions. What are the flaws in the present ranking framework, some observations have been made based on the published documents and education newsletters. Some additional measures have also been suggested, which may be considered by the ranking agency in the forthcoming years, to make the present ranking framework more robust and stable. However, the NIRF ranking framework has considered broad areas in their ranking process compared to QS and THE WUR. If considering the additional measures suggested above rationally, will definitely make the present ranking framework more robust and stable and that will help a lot to the academic leaders, decision makers, institutions, parents and students.

Abbreviations

NIRF: National Institutional Ranking Framework, HEIs: Higher Education Institutions, UGC: University Grants Commission, POA: Programme of Action, NAAC: National Assessment and Accreditation Council, AISHE: All India Survey of Higher Education, IITs: Indian Institute of Technologies, IISc: Indian Institute of Science, IISERs: Indian Institutes of Science Education and Research, MHRD: Ministry of Human Resource Development, GoI: Government of India, QS: Quacquarelli Symonds, THE: Times Higher Education, INFLIBNET: Information and Library Network, AICTE: All India Council for Technical Education, TLR: Teaching, Learning & Resources, RPC: Research and Professional Practice, GO: Graduation Outcomes, OI: Outreach and Inclusivity, PR: Perception.

REFERENCES

Ali, M. G. (2022). A general perspective about institutional rankings, ranking framework, benefits of rankings and ranking methodological flaws and best approach for being a world class institution. *International Journal of Educational Research Review (IJERE),* 7(3), 156-164, DOI:10.24331/ijere.1067952.

All India Survey on Higher Education (AISHE) (2018-19). *Ministry of human resource development. Govt. of India.*

Balasubramani, J. & Thangavel, R. (2019). Contributions of National Institutional Ranking Framework (NIRF) ranked IIT's in ResearchGate and Databaeses: A study. *Library Philosophy and Practice (e-journal).2583.https://digitalcommons.unl.edu/libphilprac/2583*

Doshi, N., Gundam,S. & Chaudhury,B. (2021). Strategizing university rank improvement using interpretable machine learning and data visualization. *Group in Computational Science and HPC, DA-IICT,* arXiv:2110.09050v2.

Gadd, E., Holmes, R. & Shearer, J. (2021). Developing a method for evaluating global university rankings. *Scholarly Assessment Reports,* 3(1): 2, 1–19.

Gupta, A., et.al. (2021). Ranking and accreditation systems: Challenges before Indian Higher Education. *Turkish Journal of Computer and Mathematics Education,* 12(8).

India Rankings. (2020). National institutional ranking framework, Ministry Of Education Government of India, Methodology for Ranking of Academic Institutions in India, (Ranking Metrics for Overall).

Koto, J., Wijaya A.A., & Putrawidjaja, M. (2018). Inconsistencies and doubtful of world university rankings. *Journal of Ocean, Mechanical and Aerospace-Science and Engineering,* 57.

Mandhirasalam, M., (2018). NIRF India Rankings 2017: An analysis, role of libraries in creating a knowledge society. RRRLF *Sponsored National Conference on Role of Libraries in Creating a Knowledge Society (SALIS 2018).*

Mantha, S.S. & Thakur, A. (2021). NIRF ranking does not give full picture of higher education in India, Forum IAS.

Maričić, M., Dobrota, M., & Bulajić, M. (2016). University Ranking In the field of Business and Management: The Stability Issues. *International Scientific Journal "Science. Business. Society",* 1, 10-13.

Marisha (2021). Analysing the stability of India Rankings. *General Articles, Current Science,* 120(7).

Ali, M. G. (2022). Detailed Review of National Institute Ranking Framework (NIRF) India Rankings including Uncertainty and Sensitivity. International Journal of Educational Research Review,7,Special Isuue,

Pallikkutam (2016). *The pros and cons of Indian ranking*. Edu News, NIRF.

Pushkar (2015). The new colleges ranking framework is a good idea – But Will it Help? *THE WIRE*.

Pushkar (2016). Straight Talk: How useful is India Rankings 2016 for students?

Saisana, M. & D'Hombres, B. (2008). Higher education rankings: Robustness issues and critical assessment. Technical Report.

Sheeja, N.K., et.al. (2018). Impact of scholarly output on university ranking, Global Knowledge, Memory and Communication. *Emerald Publishing Limited*, 67(3), 154-165, DOI:10.1108/GKMC-11-2017-0087

Srimathi, H. & Krishnamoorthy, A. (2020). Review on NIRF. *Journal of Critical Reviews*, 7(4).

Zornić, N., Dobrota, M., & Jeremić, V. (2016). Measuring the Stability of University Rankings in the Field of Education. Entrenova, 8-9, September, *Innovation Research & Policy Network (IRPN)*.

InternetSources:

https://www.researchgate.net/publication/344326641_NIRF_India_Rankings_2017_An_Analysis/link/5f684bad299bf1b53ee76817/download

Source: DOI: *https://doi.org/10.29024/sar.31*

Source: http://www.jcreview.com/admin/Uploads/Files/61a8cc3195dad0.59356675.pdf

Source: https://arxiv.org/pdf/2110.09050.pdf

Source: https://digitalcommons.unl.edu/libphilprac/2583

Source: https://isomase.org/Journals/index.php/jomase/article/view/26

Source: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3282325

Source: https://stumejournals.com/journals/sbs/2016/1/10

Source: https://thewire.in/education/the-new-colleges-ranking-framework-is-a-good-idea-but-will-it-help

Source: https://www.braingainmag.com/how-useful-is-india-rankings-2016-for-students.htm

Source: https://www.currentscience.ac.in/Volumes/120/07/1144.pdf

Source: https://www.education.gov.in/sites/upload_files/mhrd/files/statisticsnew/AISHE%20Final%20Report%202018-19.pdf

Source: https://www.emerald.com/insight/content/doi/10.1108/GKMC-11-2017-0087/full/pdf?title=impact-of-scholarly-output-on-university-ranking

Source: https://www.iasparliament.com/current-affairs/daily-news/flaws-in-the-nirfs-ranking

Source: https://www.nirfindia.org/Home

Source: https://www.nirfindia.org/nirfpdfcdn/2020/framework/Overall.pdf

Source: https://www.pallikkutam.com/edu-news/the-pros-and-cons-of-indian-ranking

Source: https://www.researchgate.net/publication/305397097_Higher_education_rankings_Robustness_issues_and_critical_assessment

https://blog.forumias.com/nirf-ranking-does-not-give-full-picture-of-higher-education-in-india/

https://indianexpress.com/article/opinion/columns/nirf-ranking-does-not-give-full-picture-of-higher-education-in-india-7554381/