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Evaluating the Effectiveness of Key Parameters in NIRF 2024 Rankings for India's Top 100 Universities

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***Abstract*—This study presents a comprehensive evaluation of the top 100 universities in the National Institutional Ranking Framework (NIRF) 2024 focussing on the key parameters Teaching, Learning, and Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI), and Perception (PR) and their respective effectiveness in the ranking process. The descriptive statistics reveal that, among the five major categories, TLR (79.43%), OI (74.96%) and GO (73.64%) show the highest effectiveness, indicating their stronger contribution to the total score of the universities, where as RP (37.57%) and PR (34.80%) show the lowest effectiveness, indicating their comparatively lower contribution to the total score of the universities. Among sub-parameters FSR (90.46%), SDG (45.29%), GUE (97.19%), and PCS (99.75%) show ccomparatively stronger contributions, whereas FRU (43.28%), FPPP (16.91%), GPHD (35.49%) and ESCS (25.83%) show comparatively lower contributions within the respective major categories, namely TLR, RP, GO and OI. The study highlights the need for greater emphasis on improving RP and PR scores to enhance the overall performance and rankings of universities in NIRF, as TLR, GO, and OI show relatively consistent performance. The study gives valuable insights into areas for improvement for prioritisationn and optimum utilisation of resources, development of effective strategies, policy, system and process for policymakers and university administrators in the near future.**

***Keywords*— NIRF 2024, University Rankings, TLR, RP, GO, OI, PR, Higher Education Performance.**

I. INTRODUCTION

University rankings have emerged as a key indicator of the performance and quality of higher education institutions. In the Indian context, the National Institutional Ranking Framework (NIRF) is the main mechanism for evaluating universities in the country. The National Institutional Ranking Framework (NIRF) was launched by the Ministry of Education, Government of India, on 29 September 2015. M. A. and Nagabhushanam (2017) noted that it is the most important instrument for the evaluation and ranking of higher education institutes around the country. NIRF ranks all universities and colleges as per a set of objective criteria and judgments for all stakeholders like students, parents, faculty members and policymakers and offers the ranking in a standardised and transparent manner. They are organised around parameters such as: Teaching, Learning, Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI) and Perception (PR) (Hazelkorn, 2014; N.K. et al., 2018). A high NIRF ranking for universities is more than a reflection of academic and research excellence; it enhances the reputation and competitiveness of universities, leading to greater access to funding, a larger student body, and better opportunities for international collaborations. The ranking is important for all the Universities' strategic planning in order to improve their performance in NIRF parameters. This study found that NIRF ranking is largely India-centric and lacks international features (Kumar et al., 2019).This raises questions regarding whether NIRF fully evaluates the quality of Indian universities. The study further asserts that the NIRF could include additional parameters such as international collaborations and faculty diversity to offer a holistic assessment (Dam et al., 2021; Kumar et al., 2020).

The decision-making process of students in choosing universities on the basis of NIRF parameters has also been the subject of another study. The researchers discovered that different stakeholders do not consistently judge and prioritise university performance in the same way. Therefore, a more inclusive and transparent NIRF methodology has been proposed, to make it responsive to a wider variety of perspectives of the different stakeholders (Kumar et al., 2020). The NIRF rankings have also been examined for their effectiveness in representing high-impact research in India. The study discovered that the rankings based on the NIRF do not always align with the quantity and quality of high-impact research produced by universities. It shows that the current parameters of NIRF may not be sufficient to measure the

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research excellence of Indian universities (Dam et al., 2021; Frenken et al., 2017). It is important therefore to revisit the current parameters of NIRF rankings and add more parameters to measure the various aspects of the universities' performance. These factors may include international collaborations, faculty diversity, entrepreneurship and innovation, as well as community engagement (Apprey et al., 2014; Frenken et al., 2017).

The NIRF ranking parameters have been analyzed in several studies that consider their role in determining the way the academic landscape of India is getting shaped. Past studies have shown that the Teaching, Learning and Resources (TLR) and Graduation Outcome (GO) domains always have a great influence on university rankings. Kumar et al. (2019) observed that universities with high TLR scores often have better infrastructure, well-qualified faculty and better learning environments that lead to better learning outcomes of the students . The authors also stressed the significance of GO, highlighting that the universities with strong graduation outcomes (employability and higher studies) perform better in rankings (Apprey et al., 2014; Hebbale et al., 2024; N.K. et al., 2018). Among Indian universities, struggles in Research and Professional Practice (RP) and Perception (PR) have been identified (Hebbale et al., 2024; Mateus & Acosta, 2022; Parameswaran et al., 2020; Reddy, 2015). Authors stressed that the low RP scores sometimes happen because of insufficient research funding, insufficient industry-academia collaboration, as well as a lack of innovation-driven initiatives. Additionally, the Perception (PR) parameter which assesses the reputation of a university in the eyes of its stakeholders is difficult to measure and enhance, particularly for new universities that have yet to establish a long-standing reputation (Reddy et al., 2016; Sharma et al., 2020).

In recent discussions about improving university performance, there has been a need to better understand these parameters. However, although several major universities have excelled across more than one parameter, differences between research output and public perception of university research show the need for specialized interventions. This study evaluates the performance of these parameters in NIRF 2024 to offer actionable insights to the universities seeking to improve their rankings and performance. Since the NIRF rankings are data-driven, it is very important to understand how much each parameter contributes to the overall score. The effectiveness of the top 100 universities in NIRF 2024 with respect to TLR, RP, GO, OI and PR and their respective sub-parameters is comprehensively analysed in this manuscript. This study analyses how effective each parameter and sub-parameters are, to determine the strengths and areas where universities need to invest more resources for improving their standings.

Moreover, the findings of this analysis will also be useful for university administrators and policymakers so that such initiatives and priorities can be prioritised to enhance the quality of education, research and inclusivity in Indian universities. Further, this study will generate insights into the trends and challenges faced by the higher education institutions in India as they compete at the global level while serving a diverse and growing student population.

II. METHODOLOGY:

The study uses data from the official NIRF web portal and considers the top 100 universities featured in NIRF 2024. The various parameters influencing the ranking of the top 100 universities were analysed for their effectiveness. The NIRF rankings are based on various parameters that reflect the overall performance of the universities. These parameters are presented in Table I. This study is descriptive cross-sectional research. Once data was gathered, statistical analyses were performed which included mean, standard deviation, minimum, maximum, and percentage effectiveness. These indicators serve to represent the performance of universities by each parameter and to compare years, showing trends and development possibilities. The percentage effectiveness was computed by employing Equation (1). This proportion is a relative measure reflecting the degree of performance achieved for each parameter compared to the maximum possible.

TABLE I
PARAMETERS AND SUB-PARAMETERS OF UNIVERSITY RANKING (NIRF 2024) (India, 2024).

Parameters / Category	Sub-parameters
1. Teaching, Learning & Resources (TLR)	Student Strength including Doctoral Students (SS) Faculty-Student Ratio with emphasis on Permanent Faculty (FSR) Combined metric for Faculty with PhD (or equivalent) and Experience (FQE) Financial Resources and their Utilization (FRU) Online Education: Online Completion of Syllabus & Exams and Swayam (OE) Combined metric for Multiple Entry/Exit, Indian Knowledge System, and Regional languages (MIR)
2. Research and Professional Practice (RP)	Combined metric for Publications (PU) Combined metric for Quality of Publications (QP) IPR and Patents: Published and Granted (IPR) • IPR and Patents: Published and Granted (IPR) • Footprint of Projects and Professional Practice (FPPP): • Combined metric for Publications & Citations in SDG's (PSDGs):
3. Graduation Outcomes (GO)	Metric for University Examinations (GUE) Metric for Number of Ph.D. Students Graduated (GPHD)
4. Outreach and Inclusivity (OI)	Percentage of Students from other States/Countries (Region Diversity RD) Percentage of Women (Women Diversity WD) Economically and Socially Challenged Students (ESCS) Facilities for Physically Challenged Students (PCS)
5. Perception (PR)	Peer Perception: Employers & Academic Peer & Accreditation (PR)

$$\% \text{ of Effectiveness} = \frac{\text{Mean value}}{\text{Maximum score attained}} \times 100 \qquad (1)$$

III. DISCUSSION AND ANALYSIS:

A. Descriptive Statistics of Sub-parameters of Category TLR:

The descriptive statistics of the sub-parameters of Teaching,

Learning and Resources (TLR) along with their effectiveness percentage in NIRF 2024 are highlighted in Table II. The effectiveness of these sub-parameters varies from 43.28% to 90.46%. When it comes to sub-parameters, Financial Resources and their Utilisation (FRU) has the lowest effectiveness (43.28%), which shows comparatively lower performance compared to other sub-parameters in TLR. Faculty-Student Ratio (FSR) is the most effective with 90.46%.

TABLE II
DESCRIPTIVE STATISTICS OF SUB-PARAMETERS OF TLR.

Sub-parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
SS	20	13.71	3.21	6.87	20.0	68.59
FSR	25	22.61	3.24	13.15	25.0	90.46
FQE	20	16.04	2.52	8.76	19.99	80.25
FRU	20	8.65	3.54	2.43	20.00	43.28
OE+MIR	15	5.23	1.24	2.00	9.50	55.05

The low effectiveness percentage of FRU indicates that greater attention and targeted strategies are required to improve this aspect of university performance. Increasing capital expenditure per student (excluding new building construction costs) and increasing operational expenditure per student (excluding hostel maintenance and related services) may support actions to enhance the FRU score.

An effective action plan to improve the FRU score could involve:

- Allocating more funding for upgrading library facilities to provide better resources and services.
- Investing in the modernization of laboratories and workshops through collaborations with industry to ensure they meet current technological standards.
- Organizing and promoting seminars, conferences, and industry interactions to foster a richer academic environment.
- Increasing the salaries of faculty members in alignment with state or central government pay scales, which would help attract and retain talented educators.
- Encouraging more faculty engagement, particularly by inviting professors of practice and industry experts to contribute to teaching and research.

The measures can contribute to improving the FRU scores of the universities and in turn, the overall TLR performance in the subsequent NIRF ranking.

B. Descriptive Statistics of Sub-parameters of Category RP:

There are descriptive statistics of sub-parameters of Research and Professional Practice (RP) with their effectiveness percentage in terms of NIRF 2024 as presented in Table III. The effectiveness of these sub-parameters ranges from 16.91% to 45.29%. Among them, Footprint of Projects and Professional Practice (FPPP) has the lowest effectiveness at 16.91%, indicating that this sub-parameter contributes the least to the overall RP score, while Sustainable Development Goals (SDG) has the highest effectiveness at 45.29%.

The relatively low effectiveness of several RP sub-parameters, particularly FPPP (16.91%) and Intellectual Property Rights (IPR) (22.69%), indicates a need for focused improvements in these areas. Enhancing RP effectiveness requires universities to invest in projects and initiatives that strengthen their research output and industry collaboration. Specific actions to improve the RP score could include:

To improve faculty productivity in RP, universities should have a clear action plan to increase the number of research-qualified faculty, provide training in research-related areas, increase the number of research scholars, establish additional Centres of Excellence, encourage collaboration with reputed institutions and industries. Specific actions are described below.

- **Increasing the number of funded research projects and collaborations** with funding agencies and industry to improve the effectiveness of the FPPP sub-parameter.
- **Fostering innovation and entrepreneurship** through more active patenting, licensing, and commercialization of research, which would enhance IPR scores.
- **Promoting high-quality publications and research output** (PU) by encouraging faculty and students to engage in quality research and publish in high-impact journals.
- **Focusing on strengthening contributions related to Sustainable Develop**ment Goals (SDGs), as they play an important role in RP performance and have demonstrated the highest effectiveness at 45.29%.

To enhance overall RP performance, universities should aim strengthen their research culture, institutional systems and processes, research support mechanisms, and incentives for faculty participation in professional practices, and actively pursue sustainable development initiatives. These strategies will help improve the effectiveness of key RP sub-parameters and, consequently, elevate their NIRF rankings in future assessments.

TABLE III
Descriptive Statistics of Sub-parameters of RP (NIRF 2024).

Sub-parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
PU	30	11.38	5.35	1.27	30.00	37.94
QP	30	12.50	5.43	3.03	27.71	45.14
IPR	15	2.95	2.98	0.00	13.00	22.69
FPPP	15	1.50	1.50	0.02	8.92	16.91
SDG	10	4.01	1.69	0.81	8.87	45.29

C. Descriptive Statistics of Sub-parameters of Category GO:

The descriptive statistics of the sub-parameters for Graduation Outcomes (GO) in the NIRF 2024 rankings along with their corresponding effectiveness percentages are

presented in Table IV. These sub-parameters show a high variation with respect to their effectiveness, with University Examinations (GUE) having a high effectiveness of 97.19%, and the number of Ph.D. Graduates (GPHD) a low effectiveness of 35.49%. The high effectiveness of GUE (97.19%) shows the effectiveness of university examination outcomes well. In contrast, however, the lower effectiveness of GPHD (35.49%) indicates that there are differences between the number of Ph.D. students admitted to, and the number completing the program. It suggests that universities should make more effort in improving the admission of doctoral students and timely completion of their Ph.D. degrees.

Universities may consider the following measures for improving GO performance, especially in GPHD: Raise the budget and provide support for doctoral programs including scholarships and research grants to motivate students to enter and complete doctoral studies. Encourage collaboration with research institutions and industry to offer opportunities for PhD students to participate in cutting edge research, which will enhance the quality and quantity of PhD graduates. Establish a mentoring scheme to support PhD students in their doctoral research and to achieve timely completion of the doctoral degree. To improve the GO score, universities can focus on increasing the number of Ph.D. graduates, thereby raising their NIRF ranking.

TABLE IV
Descriptive Statistics of Sub-parameters of GO (NIRF 2024)

Sub-parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
GUE	100	58.31	3.26	40.68	60.00	97.19
GPHD	100	14.19	9.70	0.62	40.00	35.49

D. Descriptive Statistics of Sub-parameters of Category OI:

Table V provides the descriptive statistics for the sub-parameters of Outreach and Inclusivity (OI) in the NIRF 2024 rankings, highlighting their effectiveness percentages. The effectiveness of the sub-parameters varies considerably, with facilities provided for the Physically Challenged Students (PCS) having the highest effectiveness at 99.75%, while Economically and Socially Challenged Students (ESCS) records the lowest effectiveness at 25.83%. Other sub-parameters for the universities in addition to PCS include Women's Diversity (WD) which has an effectiveness of 92.07% which promotes gender diversity and inclusivity. The lower effectiveness of ESCS indicates that more effort is needed to support students from economically and socially disadvantaged backgrounds.

The following strategies could help improve the ESCS and overall OI performance:

- Participation of economically and socially disadvantaged students in higher education should be increased through additional financial aid and scholarships.
- Improve outreach programs that inform more underprivileged groups (and particularly those in rural and underserved areas) about educational opportunities.

Provide socially and economically challenged students with support services such as mentorship, counselling and career guidance services.

Universities can improve their OI score, and thereby strengthen their position in the NIRF rankings, by addressing ESCS gaps while maintaining strong performance in other areas.

TABLE V
Descriptive Statistics of Sub-parameters of OI (NIRF 2024).

Sub-parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
RD	100	11.79	7.86	0.00	24.55	48.03
WD	100	27.62	3.33	11.34	30.00	92.07
ESCS	100	2.74	2.52	0.00	10.64	25.83
PCS	100	19.95	0.50	15.00	20.00	99.75

E. Perception (PR):

Figure 1 shows a histogram of the distribution of the Perception (PR) parameter scores of NIRF 2024 ranked universities. The PR parameter reflects how universities are perceived by important stakeholders, particularly academic peers and employers. The average PR score is 34.73, indicating a generally moderate-to-low level of stakeholder perception across the universities. The standard deviation of 15.35 shows substantial variation in perception, since universities in the sample are viewed differently by stakeholders. Most scores are concentrated between 20 and 50, meaning that a large number of universities have perception scores below 50. This distribution demonstrates clear potential for enhancing institutional perception. A small number of universities record very high perception scores, approaching 100; these institutions represent outliers with strong and well-established reputations. However, more than 85 percent of universities have perception scores below 75, indicating a substantial opportunity for improvement across the higher education sector. Universities must take active steps to enhance their institutional brand, visibility, and perception scores. Promoting academic achievements, research outputs, and faculty accomplishments can strengthen stakeholder perception. Universities can further enhance their credibility and reputation through collaborative research and stronger industry partnerships. In addition, systematic engagement with alumni, employers, and academic peers can improve institutional visibility. However, contributions to the community and good communication of such contributions can also enhance public perception. Addressing these areas will help universities improve both the Perception (PR) parameter and their overall NIRF performance.

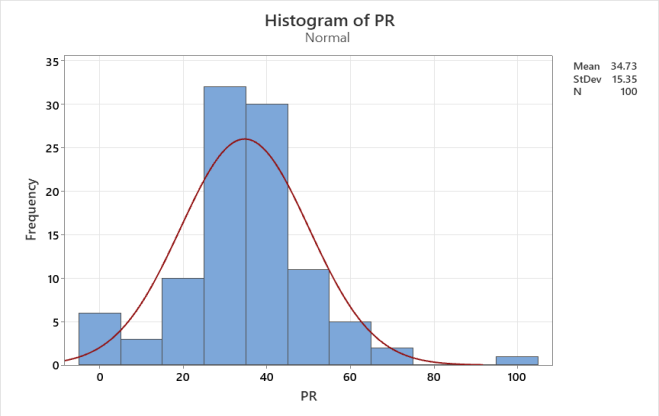

Fig. 1. Distribution of Perception (PR) Scores across the Top 100 Universities in NIRF 2024.

F. NIRF Rankings on Five Main Parameters of Universities:

The NIRF ranking system uses five parameters to rank universities: TLR, RP, GO, OI and Perception. Each parameter contributes to the overall ranking score according to the NIRF methodology. A comparison across NIRF 2022, 2023, and 2024 is presented.

TABLE VI
Descriptive statistics of NIRF 2022 University Ranking Parameters.

Parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
TLR	100	59.08	8.03	38.80	82.08	71.98
RP	100	27.45	14.42	3.09	87.45	31.39
GO	100	72.47	10.67	49.62	97.74	74.15
OI	100	59.86	8.38	33.44	81.14	73.78
PR	100	33.11	14.42	1.54	100.00	33.11

Table VI presents the descriptive statistics for the NIRF 2022 university ranking parameters, showcasing the effectiveness of key metrics used to evaluate higher education institutions. The effectiveness percentages range from 31.39% to 74.15%, indicating the influence of each parameter on the total score. Notably, RP and PR are the least effective parameters, indicating their minimal contribution to the total score of NIRF 2022. Conversely, TLR, GO, and OI show higher effectiveness indicating their stronger contributions to the total score of NIRF 2022

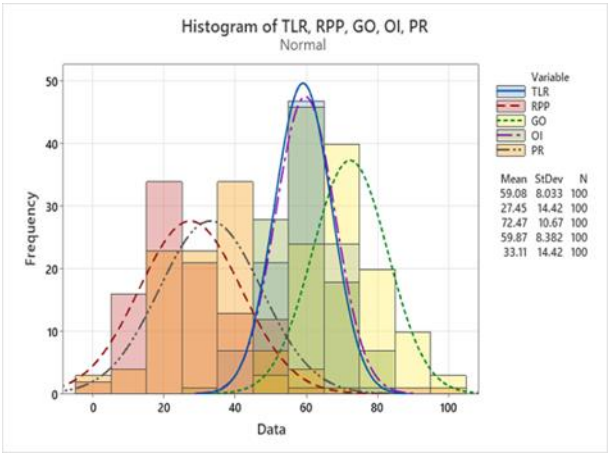

Fig. 2. Overlaid histograms comparing parameter distributions (TLR, RP, GO, OI, PR) for NIRF 2022.

Figure 2 presents an overlaid histogram comparing the distributions of the five key parameters in the NIRF 2022 rankings: Teaching, Learning, and Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI), and Perception (PR). The illustration reveals that approximately 80% of the top 100 ranked universities, recorded scores below 60% for parameters RP and PR, indicating sub-optimal performance in Research and Professional Practice and Perception parameters.

TABLE VII
Descriptive statistics of NIRF 2023 University Ranking Parameters.

Parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
TLR	100	60.86	7.98	45.27	82.43	73.83
RP	100	30.59	14.57	5.60	88.45	34.58
GO	100	73.19	10.36	50.69	99.64	73.45
OI	100	60.89	8.40	46.65	83.41	73.01
PR	100	32.86	14.45	1.94	98.56	33.34

Table VII contains the descriptive statistics for the University Ranking parameters, which reveal the performance and effectiveness of the key parameters for assessing the higher education institutions for NIRF 2023. Percentages of effectiveness vary from 33.34% to 73.83%, indicating the relative importance of each parameter in determining the score. Research and Professional Practice (RP) and Perception (PR) turn out to be the least effective parameters, as they contribute relatively less to the overall NIRF 2023 score. Teaching, Learning and Resources (TLR), Graduation Outcomes (GO) and Outreach and Inclusivity (OI) exhibit greater effectiveness and greater impact on the overall score.

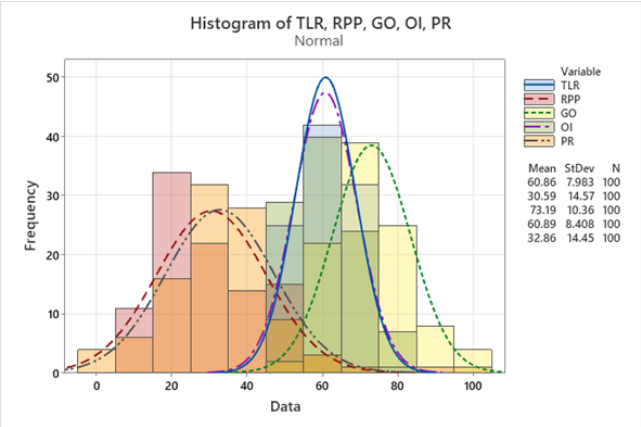

Fig. 3. Overlaid histograms comparing parameter distributions (TLR, RP, GO, OI, PR) for NIRF 2023.

An overlaid histogram is shown in Figure 3, comparing the distribution of the five key parameters of the NIRF 2023 rankings – namely Teaching, Learning and Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI) and Perception (PR). The histogram shows that around 80% of the top 100 universities have achieved a score of less than 60% in both RP and PR parameters. This reflects sub-optimal performance in these areas, suggesting that most universities have difficulties in research output, professional practice, building a strong public and peer perception.

TABLE VIII
Descriptive statistics of NIRF 2024 University Ranking Parameters.

Parameters	N	Mean	SD	Min.	Max.	% of Effectiveness
TLR	100	66.40	6.88	47.70	83.60	79.43
RP	100	32.50	14.21	6.29	86.50	37.57
GO	100	72.56	10.37	50.76	98.54	73.64
OI	100	62.29	7.94	48.93	83.10	74.96
PR	100	34.73	15.35	2.86	99.79	34.80

The descriptive statistics for the NIRF 2024 university ranking parameters are presented in Table VIII, which shows the effectiveness of the chosen parameters to assess higher education institutions. The effectiveness percentages vary from 34.80% to 79.43%, which indicates the different levels of importance of each parameter on the overall score. However, the least effective parameters are Research and Professional Practice (RP) and Perception (PR), indicating that they contribute the least to the overall NIRF 2024 score. Contrastively, on the other hand, Teaching, Learning and Resources (TLR), Graduation Outcomes (GO), and Outreach and Inclusivity (OI) are the ones that have the most weightage in the total score in NIRF 2024. Based on this, the contribution of the five parameters towards the NIRF 2024 result is evident, which indicates that RP and PR are the two key areas that need to be worked upon. The university can achieve better research results, better cooperation with enterprises, and enhance the influence of the university. Focus on these areas can help in improving the performance of the institutions and their future NIRF rankings.

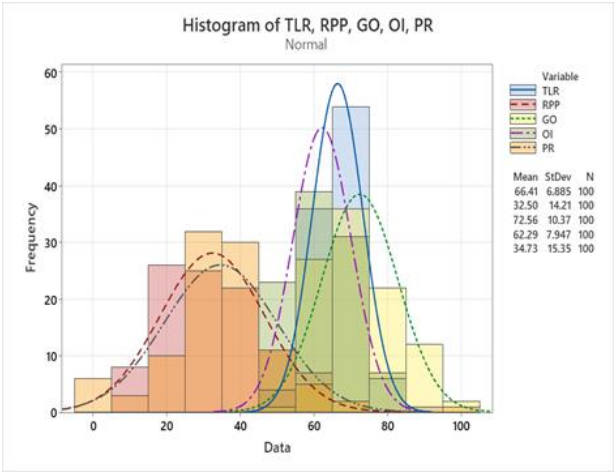

Fig. 4. Overlaid histograms comparing parameter distributions (TLR, RP, GO, OI, PR) for NIRF 2024.

Figure 4 presents an overlaid histogram comparing the distribution of the five key parameters from the NIRF 2024 rankings, namely Teaching, Learning, and Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI), and Perception (PR). The illustration reveals that the majority of institutions, approximately 80% of the top 100 ranked universities, have achieved scores below 60% in both the RP and PR parameters. This indicates sub-optimal performance in these areas, suggesting that many universities continue to face challenges in research output and professional practice, as well as in building a strong public and peer perception.

TLR and GO remain strong areas, and RP and PR are critical areas to improve compared to previous years (Table VIII). A university's ranking depends on research development and making that research more visible and valued by stakeholders (Hebbale et al., 2024).

TABLE IX
Correlation Matrix of NIRF Parameters with Overall Scores (2024)

Parameter	Pearson r	Spearman ρ
TLR	0.82	0.79
RP	0.44	0.40
GO	0.76	0.73
OI	0.61	0.58
PR	0.31	0.28

Table IX presents the Pearson and Spearman correlation coefficients between overall NIRF 2024 scores and individual parameter scores. The results reveal that Teaching, Learning & Resources (TLR) and Graduation Outcomes (GO) exhibit strong positive correlations with overall scores, confirming their dominant role highlighted in the effectiveness analysis

(Table VIII). Outreach and Inclusivity (OI) shows moderate correlation, reflecting its supportive role. Conversely, Research and Professional Practice (RP) and Perception (PR) display weak correlations, consistent with their relatively low effectiveness percentages. These results reinforce the descriptive data and highlight the importance of the strategic use of RP and PR by universities to improve their overall NIRF rankings.

IV. BRIEF SUMMARY OF NIRF 2024 IN COMPARISON WITH 2022 AND 2023

When compared to the rankings of the top 100 universities in the 2022 and 2023 NIRF reports, the analysis points out the areas of improvement as well as certain weaknesses in various performance areas. Using descriptive statistics and overlaid histograms for parameters such as Teaching, Learning, and Resources (TLR), Research and Professional Practice (RP), Graduation Outcomes (GO), Outreach and Inclusivity (OI), and Perception (PR), it is evident that while universities have made improvements in some areas, others still require significant attention.

From 2022 to 2023, TLR improved steadily from the mean score of 59.08 in 2022 to a mean of 60.86 in 2023; from 2023 to 2024, the TLR mean score further improved to 66.40, indicating stronger teaching and learning resources and faculty resources. However, GO retained consistent strength, with a mean score of 72.56 in 2024, indicating that GO continued to perform well regarding graduation outcomes but there was a slight increase in the variability experienced in this area over the years.

A modest growth of OI was observed (mean scores of 59.86 in 2022, 60.89 in 2023, and 62.29 in 2024), which shows that universities are continuing to adopt inclusive and diverse practices. However, RP remains a major area of concern and showed only slight improvement. Research output and industry collaboration present areas of weakness where the performance of universities continues to be low with a mean score of 32.50 in 2024 against 27.45 in 2022 and 30.59 in 2023, with substantial differences in performance across universities. Overall, PR remains the most challenging parameter, with its mean at 34.73 in 2024 improving very little from its values in 2022 (33.11) and 2023 (32.86). The large spread of the PR histogram seems to indicate that universities are continuing to face difficulty in establishing a strong employer and peer perception.

The overall results show that in TLR, GO and OI there is gradual progress, whereas in RP and PR the challenges remain largely unresolved. Institutions must concentrate on improving their research capacity and building a stronger positive perception if they want to improve their overall rankings in the future. The data of 2024 clearly highlights the need for targeted approaches to bridge these gaps, and to pursue a more balanced growth in all respects.

The findings also align with established higher education performance theories. The strong influence of TLR and GO supports the Resource-Based View (RBV), where institutional resources and capabilities enhance competitiveness. Conversely, the weaker contributions of RP and PR resonate with Institutional Theory, which emphasizes the gradual development of legitimacy and reputation in shaping stakeholder perceptions.

Future Effective Measures: To enhance the NIRF performance, universities can have to do the following: Strengthen Research Output (RP), Public Perception (PR) and Inclusivity (OI). Additional improvements to RP are possible with greater funding and better industry partnerships. Systematic outreach to alumni, industry leaders and other stakeholders as well as increasing visibility of institutional accomplishments can help to improve PR. Scholarships, mentorship and support services should be implemented to benefit underrepresented groups to improve OI. Rural and disadvantaged communities can be expanded through outreach programs to increase the diversity of student populations. Investments in academic infrastructure, faculty quality and student resources support improvements in Teaching, Learning and Resources (TLR) as well as Graduation Outcomes (GO) performance, which are measures of international and national reputation. Career service and industry partnership should also be more closely aligned to enhance graduate employability.

CONCLUSIONS

In the present study, the top 100 Indian universities were analysed with respect to the effectiveness of the NIRF 2024 parameters. The results demonstrate a high degree of parameter influence on the overall ranking. Teaching, Learning and Resources (TLR), Graduation Outcomes (GO) and Outreach and Inclusivity (OI) appeared to be the strongest contributors while Research and Professional Practice (RP) and Perception (PR) were comparatively weaker. This highlights the need to sustain strengths in core academic areas while addressing gaps in research output and stakeholder perception.

Table X
Synthesis of NIRF 2024 Parameter Effectiveness, Correlations, and Key Observations

Parameter	% Effectiveness (2024)	Pearson r	Spearman ρ	Key Observations
TLR	79.43	0.82	0.79	Strong contributor; reflects faculty & resource strength
RP	37.57	0.44	0.40	Weakest contributor; needs research funding & industry linkages
GO	73.64	0.76	0.73	Strong contributor; driven by graduation outcomes & exam performance
OI	74.96	0.61	0.58	Strong contributor; reflects inclusivity & diversity practices
PR	34.80	0.31	0.28	Weak contributor: perception building remains challenging

Table X synthesises the overall findings by presenting effectiveness percentages, correlation strengths, and key

observations for each NIRF parameter. This consolidated view highlights the consistent strength of TLR, GO, and OI, and the persistent challenges faced by RP and PR in contributing meaningfully to rankings.

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