

State of Higher Education in Odisha through the Lens of National Institutional Ranking Framework (NIRF) 2024

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Abstract:

This research paper examines the state of higher education in Odisha through the lens of the National Institutional Ranking Framework (NIRF) 2024, focusing specifically on the performance of key state public and private universities across the Teaching, Learning, and Resources (TLR) and Research and Professional Practices (RP) parameters. The study aims to provide a comprehensive evaluation of these institutions in areas critical to academic quality, including faculty qualifications, student strength, research output, and resource utilization. The analysis involved a comparative assessment of three universities: Siksha 'O' Anusandhan (SOA), KIIT University, and Utkal University. Quantitative data from the NIRF rankings were combined with qualitative insights drawn from existing literature and policy documents. The findings reveal significant disparities in performance, with private institutions like SOA and KIIT excelling in TLR components such as Faculty-Student Ratio (FSR) and Faculty with PhD and Experience (FQE), while Utkal University, a prominent public institution, lags behind. In the RP parameter, Utkal University's performance is notably weak in areas like publications and intellectual property rights (IPR), highlighting a lack of research infrastructure and academic rigor. The study also identifies critical gaps in financial resource utilization, affecting the quality of education and research across all institutions. The paper concludes with targeted recommendations to improve faculty recruitment, enhance research output, and strengthen industry linkages in Odisha's universities. These measures are essential for elevating the state's higher education landscape and ensuring sustained academic excellence in alignment with national and global standards.

Keywords — Higher Education, NIRF Rankings, Odisha State Public Universities, Research and , Professional Practice (RPP), Teaching, Learning, and Resources (TLR).

I BACKDROP

The quality of higher education plays a pivotal role in shaping the socio-economic landscape of a region. A systematic framework like the National Institutional Ranking Framework (NIRF) is essential to ensure that institutions are evaluated based on consistent and objective criteria. Such a framework enables the identification of strengths and weaknesses within educational institutions, facilitating targeted interventions for improvement. It also promotes transparency, accountability, and

competition among institutions, driving them to maintain and enhance academic standards. In Odisha, where higher education institutions are striving to achieve national recognition, the NIRF provides a structured approach to assess and benchmark their performance against national standards. This systematic evaluation helps stakeholders, including students, parents, and policymakers, make informed decisions, thereby contributing to the overall enhancement of educational quality in the state (MHRD, 2024; Dash,

2024). Moreover, it fosters an environment of continuous improvement by encouraging institutions to adopt best practices and innovative pedagogies (Kumar, 2024). As higher education increasingly influences employability and research output, a systematic framework like NIRF becomes indispensable for ensuring that institutions in Odisha not only meet but exceed national benchmarks.

The National Institutional Ranking Framework (NIRF) was officially launched on 29th September 2015 by the Honourable Minister of Human Resource Development, marking a significant step in standardizing the evaluation of higher education institutions across India. Approved by the Ministry of Human Resource Development (MHRD), NIRF provides a robust framework for ranking institutions based on a comprehensive and standardized methodology.

The framework was developed following the recommendations of a Core Committee set up by the MHRD, which aimed to create a transparent, credible, and consistent ranking system that could be applied across the diverse higher education landscape of India. The NIRF methodology is designed to reflect the core aspects of institutional performance and quality, ensuring that the rankings are meaningful and reliable.

The NIRF evaluates institutions across five broad parameters: **Teaching, Learning, and Resources**; **Research and Professional Practices**; **Graduation Outcomes**; **Outreach and Inclusivity**; and **Perception**. Teaching, Learning, and Resources assess the quality of education through factors such as the learning environment, infrastructure, faculty qualifications, and student-faculty ratios. Research and Professional Practices measure the volume, quality, and impact of research output along with the institution's collaborations and professional engagements. Graduation Outcomes evaluate student success by examining graduation rates, placements, and pursuit of higher education opportunities. Outreach and Inclusivity consider how effectively an institution serves

underprivileged communities and promotes diversity across gender, geography, and socio-economic backgrounds. Lastly, Perception captures the overall reputation and esteem of the institution among peers, employers, and the general public.

The 2024 NIRF ranking process involved the collection of institutional data from September 2023 to January 2024. Following this, the compilation, publication, citation, and patent data were gathered between March and April 2024. During this period, data verification was also conducted to ensure accuracy and reliability. The final report, reflecting the comprehensive evaluation of institutions, was released in August 2024. This rigorous process ensured that the rankings provided an accurate and up-to-date assessment of higher education institutions across the country.

In the 2024 NIRF rankings, Odisha's universities showed varied performances. Siksha 'O' Anusandhan (SOA) University and KIIT University were standout performers, securing 14th and 15th positions respectively in the top 100 universities in India. Both universities demonstrated strong overall institutional quality, particularly in areas such as teaching, research, and professional practices. Utkal University, a prominent government-run institution, maintained its status among the top 50 state public universities in India, ranking 42nd. However, it fell within the 151-200 band in the overall rankings, indicating room for improvement in areas like research output and institutional reputation. Sambalpur University, another significant public institution in Odisha, also featured in the 101-150 rank band among Indian universities but couldn't secure any spot in first 50 list of state public universities.

The 2024 NIRF rankings reveal that while a few universities in Odisha, such as Siksha 'O' Anusandhan (SOA) University and KIIT University, have excelled, there is ample room for improvement across the state's higher education landscape. Notably, institutions like Utkal University and Sambalpur University, though

significant, did not achieve top-tier rankings, with Utkal falling within the 151-200 band and Sambalpur unable to secure a spot among the top 50 state public universities. This underscores the need for a detailed analysis of key quality parameters where these institutions lag, particularly in research output, institutional reputation, and professional practices. It is imperative that both the government and university administrations prioritize addressing these deficiencies. By focusing on enhancing these critical areas, Odisha can foster a more competitive academic environment that ensures the provision of high-quality education to its students, ultimately strengthening the state's overall educational standing on a national level.

II OBJECTIVE OF THIS PAPER

The objective of this paper is twofold. First, it aims to critically analyze the quality parameters used by the National Institutional Ranking Framework (NIRF) to rank higher education institutions, identifying which parameters carry the most weight in determining rankings. By understanding the emphasis placed on different factors such as Teaching, Learning, and Resources; Research and Professional Practices; Graduation Outcomes; Outreach and Inclusivity; and Perception, this paper seeks to uncover the driving forces behind institutional rankings. The second objective is to evaluate the performance of Odisha's universities against these key parameters. By comparing the state universities' standings with the national benchmarks, the paper seeks to identify specific areas where these institutions lag, particularly in research output, professional practices, and institutional reputation. This analysis is intended to inform strategies for improving the quality and competitiveness of higher education in Odisha.

Going by the above purpose, the following objectives have been framed:

1. To analyze the quality parameters utilized by the National Institutional Ranking Framework (NIRF) and determine which parameters have the

highest impact on the overall ranking of higher education institutions.

2. To assess the performance of universities in Odisha against the identified NIRF parameters, identifying key areas where these institutions fall short, with a focus on key parameters.

II METHODOLOGICAL INSIGHTS TO NIRF 2024

The National Institutional Ranking Framework (NIRF) adopts a comprehensive methodology by evaluating higher education institutions across five key parameters. Each parameter carries a specific weightage that contributes to the overall ranking. **Teaching, Learning, and Resources** and **Research and Professional Practice** are the most critical, each with a weightage of 0.30, reflecting their central role in determining institutional quality. **Graduation Outcomes** follow with a weightage of 0.20, emphasizing the importance of student success. **Outreach and Inclusivity** and **Perception** are given weightages of 0.10 each, recognizing the significance of diversity, societal impact, and institutional reputation in the ranking framework.

Since **Teaching, Learning, and Resources (TLR)** and **Research and Professional Practice (RPP)** are the most critical parameters in the NIRF ranking framework, each carrying a weightage of 0.30, this paper delves deeper into the sub-indicators used under these parameters. For TLR, factors such as faculty qualifications, student-faculty ratio, infrastructure, and financial resources are crucial in assessing the quality of education and learning environment. RPP, on the other hand, evaluates the volume, quality, and impact of research output, including publications, citations, patents, and professional collaborations.

From a university's perspective, focusing on these two indicators is vital as they directly influence academic reputation and the ability to attract top talent—both faculty and students. A strong performance in TLR ensures that students receive a robust education supported by well-qualified teachers and state-of-the-art facilities. Meanwhile,

excellence in RPP reflects the university's contribution to knowledge creation and innovation, which enhances its prestige and global standing.

Teaching, Learning, and Resources (TLR)

Under the **Teaching, Learning, and Resources (TLR)** parameter, the NIRF framework allocates 100 marks across five critical sub-indicators to comprehensively assess the quality of education provided by an institution. The distribution of marks is as follows:

Sub Parameter-1: Student Strength, including Doctoral Students (SS): Allocated 20 marks, this sub-indicator measures the institution's capacity to attract and retain students at all levels, highlighting the scale and diversity of the student body.

The Student Strength including Ph.D. students (SS) component, worth 20 marks, evaluates the scale of an institution's student body by considering both undergraduate (UG) and postgraduate (PG) enrollments, as well as doctoral students. The formula used is:

$$SS = f(NT, NE) \times 15 + f(NP) \times 5$$

Here's what each term means:

NT (Total sanctioned approved intake): This is the maximum number of students an institution is allowed to admit across all UG and PG programs. **NE (Total number of students enrolled):** This is the actual number of students currently enrolled in all UG and PG programs. **NP (Total number of Ph.D. students):** This is the number of students enrolled in doctoral programs up to the previous academic year.

In a social science department, suppose the institution has an approved intake capacity of 500 students (NT) and currently has 450 students enrolled (NE). If there are 30 doctoral students (NP), the marks awarded will be influenced by these numbers. The exact weighting is determined by NIRF, but generally, higher values in NT and NE, as well as a larger number of NP, contribute to a better score, reflecting the institution's ability to

attract and support a substantial number of students across different levels.

Sub Parameter-2: Faculty-Student Ratio (FSR), with an emphasis on permanent faculty, receives 25 marks. This sub-indicator underscores the importance of maintaining an optimal balance between students and well-qualified faculty, which is crucial for effective learning.

To understand the Faculty-Student Ratio with emphasis on permanent faculty (FSR), consider a practical example. This metric, which is worth 25 marks, evaluates the balance between faculty members and students, focusing specifically on full-time regular faculty. The formula used is $FSR = 25 \times [15 \times (F/N)]$, where **F** is the number of full-time regular faculty members from the previous year, and **N** represents the total number of students, including both undergraduate and postgraduate levels. For instance, in a social science department with 30 full-time faculty members and 450 students, we calculate the FSR score as follows: $FSR = 25 \times [15 \times (30/450)]$. Simplifying this, the faculty-to-student ratio is $30/450 = 0.0667$, which, when multiplied by 15, equals 1. Applying this to the formula yields $FSR = 25 \times 1 = 25$. Hence, the department earns the full 25 marks for the FSR component, demonstrating a favourable faculty-to-student ratio.

Sub Parameter-3: Combined Metric for Faculty with PhD (or equivalent) and Experience (FQE): Awarded 20 marks, this sub-indicator assesses the qualifications and experience of faculty members, which are key to delivering high-quality education.

The Combined Metric for Faculty with PhD (or equivalent) and Experience (FQE) is a way to evaluate the qualifications and experience of faculty members, which together contribute 20 marks in the NIRF ranking. Here's how it works:

FQ (Faculty Qualification): This component focuses on the percentage of faculty with a PhD or an equivalent qualification. If less than 95% of the faculty have a PhD, the FQ score is calculated using

the formula: $FQ = 10 \times (FRA/95)$, where FRA is the percentage of faculty with a PhD. If 95% or more of the faculty have a PhD, the FQ score is a full 10 marks.

FE (Faculty Experience): This part assesses faculty experience across three categories: (**F1**: Faculty with up to 8 years of experience, **F2**: Faculty with 8 to 15 years of experience and **F3**: Faculty with more than 15 years of experience)

The score for each category is calculated using a ratio of 1:1:1, meaning an ideal balance across all three experience levels. The FE score is calculated as $FE = 3\min(3F1, 1) + 3\min(3F2, 1) + 4\min(3F3, 1)$. Finally, the total FQE score is the sum of FQ and FE.

Imagine a university's sociology department has 90% of its faculty with PhDs, so the FQ would be $10 \times (90/95) = 9.47$. If the experience distribution is balanced with roughly equal fractions of faculty in each experience category, the FE score could approach 10. The combined FQE score would then reflect both the strong qualifications and the balanced experience of the faculty, potentially earning close to the full 20 marks.

Sub Parameter-4: Financial Resources and their Utilization (FRU): Also assigned 20 marks, this sub-indicator evaluates how effectively an institution manages and uses its financial resources to support educational activities.

The **Financial Resources and their Utilisation (FRU)** component in the NIRF framework is allocated 20 marks and is crucial for assessing how effectively an institution manages its financial resources to support educational activities. The FRU score is calculated using two main factors:

BC (Average Annual Capital Expenditure per student for the previous three years): This refers to the money spent on things like equipment, technology, and infrastructure improvements, but excludes the cost of constructing new buildings. It carries a weight of 5 marks.

BO (Average Annual Operational Expenditure per student for the previous three years): This includes regular expenses like salaries, utilities, and academic programs, but excludes costs related to hostel maintenance and similar services. It carries a weight of 15 marks.

To calculate the FRU score, the formula $FRU = 5 \times f(BC) + 15 \times f(BO)$ is used, where "f" represents the function of these expenditures per student.

For example, in social science research, if a university spends on upgrading research facilities or subscribing to important databases (BC), this investment helps improve the quality of research output. Similarly, spending on experienced faculty or academic programs (BO) ensures that students receive high-quality education and guidance. Together, these expenditures reflect how well a university is utilizing its financial resources to enhance educational outcomes, directly impacting its overall ranking.

Sub Parameter-5: Online Education (OE), which includes Online Completion of Syllabus & Exams and Swayam, is given 15 marks, reflecting the growing importance of digital education and resource accessibility in modern learning environments.

The Online Education (OE) component, which accounts for 15 marks in the NIRF framework, focuses on how effectively an institution utilizes online platforms to deliver education. The estimation, expressed as $OE = f(OE)$, simply means that the quality of online education (OE) is determined by the various services and resources that the institution provides online. These services include the completion of syllabi, conducting exams online, and the use of platforms like Swayam, which offers free online courses.

In simpler terms, this means that the more comprehensive and effective the online education services are, the better the institution will score in this component. For instance, if a university in social sciences uses online platforms to deliver lectures, conduct discussions, and assess students

through online exams, and does so efficiently, it will score higher in this area.

Imagine a university offering a course in sociology. If the course content is fully accessible online, with recorded lectures, discussion forums, and regular online assessments, and if students can complete all these requirements online, this contributes positively to the OE score. Additionally, if the course is available on platforms like Swayam, where students from across the country can enroll and learn, it further enhances the institution's score under the OE component.

Research and Professional Practice (RP)

Under the **Research and Professional Practice (RP)** parameter, which carries a weightage of 0.30 and totals 100 marks, four key sub-indicators are assessed to evaluate an institution's research output and professional activities.

Sub Parameter-1: Combined Metric for Publications (PU): This sub-indicator measures the quantity of research publications produced by the institution, reflecting its academic productivity. The Combined Metric for Publications (PU) component, which is worth 35 marks, measures the research productivity of an institution. The formula $PU = 35 \times f(P/FRQ)$ helps in calculating these marks. Here's how it works:

P represents the total number of research publications produced by the institution. This number is weighted and verified by trusted third-party sources to ensure accuracy.

FRQ stands for the Faculty Research Quotient, which is the maximum number of faculty members needed to maintain a Faculty-Student Ratio (FSR) of 1:15 or the actual number of faculty available, whichever is higher. In simpler terms, the PU score reflects how many research papers an institution publishes relative to its faculty size. If an institution has more publications per faculty member, it will score higher in this component.

Suppose a university has a sociology department with 30 faculty members and they publish 60

research papers in a year. If the ideal faculty size for their student population is also 30 (based on the 1:15 FSR), their PU score will be higher because the ratio of publications to faculty members is strong, indicating good research productivity.

Sub Parameter-2: Combined Metric for Quality of Publications (QP): This sub-indicator assesses the quality of the publications, considering factors like citations and impact, which indicate the influence and relevance of the research. The Combined Metric for Quality of Publications (QP), which is worth 35 marks, evaluates how impactful a university's research publications are. The estimation for QP is expressed as:

$QP = 20 \times f(CC/FRQ) + 15 \times f(TOP25P/P)$. Here's what each part means:

CC (Total Citation Count): This represents the total number of times the university's research publications have been cited by other scholars over the last three years. Citations are a way to measure how influential the research is.

FRQ (Faculty Research Quotient): This factor adjusts the citation count based on the number of faculty members, ensuring that the score is fair regardless of the institution's size.

TOP25P: This measures the number of citations that fall within the top 25% of the most-cited publications, showing the highest quality of research.

Imagine a sociology department at a university publishes research on social inequality. If their papers are frequently cited by other researchers (high CC) and many of those citations are among the most-cited in their field (high TOP25P), their QP score will be high. This reflects the department's strong impact and reputation in the field of social science.

Sub Parameter-3: IPR and Patents: Published and Granted (IPR): This sub-indicator evaluates the institution's contributions to innovation by measuring the number of intellectual property rights (IPRs) and patents that have been published and

granted. The **IPR and Patents** component in the NIRF framework, worth 15 marks, evaluates an institution's contribution to innovation through patents. This is measured by the formula $IPR = IPG + IPP$, where:

IPG represents the patents granted and is calculated as $10 \times f(PG)$, where **PG** is the number of patents granted to the institution over the past three years. The more patents granted, the higher the score.

IPP represents the patents published and is calculated as $5 \times f(PP)$, where **PP** is the number of patents published in the last three years. Again, a higher number of published patents leads to a better score. In simple terms, the more patents an institution has published and granted, the higher it will score in this component.

Suppose a university's education department develops a new digital platform that enhances online teaching methodologies, making it easier for educators to engage with students. If the university applies for and is granted a patent for this innovative platform, it contributes to the **IPG** score, reflecting patents granted. If the patent is published but still awaiting approval, it contributes to the **IPP** score. Both the granted and published patents improve the university's IPR score, highlighting its role in advancing educational technology and innovation. This, in turn, enhances the university's standing in the NIRF rankings, showcasing its contributions to improving education through innovative practices.

Sub Parameter-4: Footprint of Projects, Professional Practice, and Executive Development Programs (FPPP): This sub-indicator examines the institution's engagement with industry and society through projects, professional practices, and executive development programs, highlighting its practical impact and outreach. The **(FPPP)** component in the NIRF ranking framework assesses how effectively an institution engages in research projects, professional practices, and executive development

programs. This component is worth 15 marks and is calculated using the following estimation:

$$FPPP = FPR + FPC + EDP/MDP.$$

FPR (Footprint of Research Projects) is calculated as 5 times the function of **RF**, which is the average annual research funding received by the institution over the past three years.

FPC (Footprint of Professional Consultancy) is also calculated as 5 times the function of **CF**, which represents the average annual earnings from consultancy services provided by the institution over the past three years.

EDP/MDP (Executive/Management Development Programs) is determined by 5 times the function of **EP**, the average annual earnings from these programs in the previous three years.

If a university's education department receives research grants to study new teaching methodologies, provides consultancy services to schools for improving curriculum and instructional strategies, and runs executive training programs for teachers and school administrators, these activities would enhance its FPPP score. For instance, if the department secures funding to explore innovative ways to integrate technology in classrooms, earns consultancy fees by advising schools on best practices for inclusive education, and generates revenue from workshops aimed at developing leadership skills for educators, all these contributions would be reflected in its FPPP score. The more successful these initiatives are, the higher the department's score in this component, highlighting its significant impact on advancing educational practices and professional development.

These sub-indicators collectively measure an institution's research capabilities, innovation, and professional influence, making them critical to the NIRF ranking framework.

Data Limitation

In this research, the data limitations significantly impacted the scope and depth of the analysis. The primary data available from universities were

limited to the top 100 universities and the top 50 public state universities as per the NIRF 2024 rankings. This restriction meant that we could only include **Siksha 'O' Anusandhan (SOA) University, KIIT University, and Utkal University** in our analysis, as they were the only institutions from Odisha that met these criteria. Specifically, SOA University and KIIT University were listed in the top 100, while Utkal University was listed in the top 50 public state universities. Consequently, this paper was unable to incorporate other universities from Odisha that might have provided a broader perspective on the state's higher education landscape.

Another significant data limitation was the unavailability of comprehensive data related to research publications, citations, and patents on a per-university basis. This gap hindered a more detailed analysis of the research output and innovation capabilities of the universities. Having access to such data would have allowed for a more robust comparison of the research credibility and academic impact of the institutions. However, due to these limitations, the analysis in this paper was confined to comparing the scores under two critical parameters: Teaching, Learning, and Resources (TLR) and Research and Professional Practice (RPP), along with their associated sub-parameters. Despite these limitations, the paper provides insights into the relative performance of the included universities based on the available data.

Another data limitation was related to the newly introduced **Sustainable Development Goal (SDG)** component under the Research and Professional Practice (RP) parameter in the 2024 NIRF rankings. This component was designed to assess how universities contributed to sustainable development through their research and professional activities. However, it was noted that the technical details and specific criteria for evaluating the SDG component were not fully available or clarified in the methodology section at the time of this study. Consequently, this aspect was not included in the analysis. The absence of detailed information on the

SDG component was considered a limitation, as it restricted the ability to evaluate how Odisha's universities were contributing to sustainability, an increasingly important area in higher education. The omission was recognized as a gap, as the SDG component represented a significant shift in the measurement of research impact, and its inclusion could have provided a more comprehensive evaluation of the universities' contributions to global challenges.

III CRITICAL ANALYSIS OF KEY UNIVERSITIES IN ODISHA ACROSS THE TLR AND RP PARAMETERS

Performance of Universities in TLR component

Student Strength including Ph.D. Students: (SS)

The Teaching, Learning, and Resources (TLR) parameter in the NIRF ranking framework is crucial for evaluating the quality of education in universities. TLR assesses the overall learning environment, including infrastructure, faculty qualifications, and the resources available to students, all of which are essential for effective teaching and learning.

Figure 1 from the provided document compares the percentage scores in the Student Strength (SS) sub-parameter among three universities in Odisha: Siksha 'O' Anusandhan (SOA) University, KIIT University, and Utkal University. The SS sub-parameter, which reflects the proportion of students enrolled in various programs relative to the total capacity, indicates how well a university attracts and retains students.

SOA University scored 0.86%, KIIT University scored 0.95%, and Utkal University scored 0.62% in SS. These scores represent the percentage obtained by each university out of the total marks allocated for this sub-parameter. Higher scores in SS suggest that SOA and KIIT have a robust student enrollment system, likely reflecting their ability to provide a conducive learning environment and resources that meet students' needs. On the other hand, Utkal University's lower score indicates

a potential area for improvement in attracting and retaining students.

Faculty-Student Ratio with emphasis on permanent faculty: FSR

In the context of the National Institutional Ranking Framework (NIRF), the Faculty-Student Ratio (FSR) is a critical sub-parameter within the Teaching, Learning, and Resources (TLR) component. The FSR measures the ratio of full-time faculty members to the number of enrolled students, reflecting the availability of faculty to provide adequate attention and support to students.

Figure 1 from the provided document reveals the percentage scores in FSR for three universities in Odisha: Siksha 'O' Anusandhan (SOA) University, KIIT University, and Utkal University. SOA University achieved a percentage score of 86%, KIIT University scored 95%, and Utkal University obtained 62%. These scores indicate the proportion of the maximum possible score that each university achieved in the FSR sub-parameter. For example, KIIT University's 95% score suggests that it has an excellent Faculty-Student Ratio, which likely contributes positively to the quality of education by ensuring that students have better access to faculty guidance and mentorship.

Combined metric for Faculty with PhD (or equivalent) and Experience: FQE

The Faculty Qualifications and Experience (FQE) sub-parameter within the Teaching, Learning, and Resources (TLR) component is crucial for evaluating the quality of education in universities. It measures the percentage of faculty members with advanced degrees (like PhDs) and their professional experience. Higher scores in FQE indicate a more qualified and experienced faculty, which is vital for delivering quality education and conducting impactful research.

In the 2024 NIRF rankings, the FQE percentage scores for three universities in Odisha are as follows: Siksha 'O' Anusandhan (SOA) University scored 82%, KIIT University scored 91%, and

Utkal University scored 74%. These scores represent the percentage of marks each university obtained out of the total possible marks for this sub-parameter. For instance, KIIT University's 91% indicates that nearly all its faculty meet the highest qualification standards, which positively impacts student learning outcomes and research quality.

Higher FQE scores generally correlate with better educational quality, as qualified faculty are more likely to engage students effectively, mentor research, and contribute to the institution's academic reputation. Conversely, lower scores, like Utkal University's 74%, suggest areas for improvement, particularly in recruiting and retaining highly qualified faculty, which could ultimately enhance the university's overall educational quality and research output.

Financial Resources and Their Utilisation: FRU

The Faculty Resources Utilization (FRU) sub-parameter within the Teaching, Learning, and Resources (TLR) component measures the extent to which faculty resources are effectively utilized in an institution, directly influencing the quality of education. A higher percentage score in FRU indicates that a university is making optimal use of its faculty resources, contributing to a better learning environment.

In the 2024 NIRF rankings, the FRU scores of three major universities in Odisha were as follows: Siksha 'O' Anusandhan (SOA) University scored 53%, KIIT University scored 36%, and Utkal University scored 29%. These scores represent the percentage of total marks each university obtained in this sub-parameter, reflecting how well they utilize their faculty resources relative to the maximum possible score.

The significant difference in FRU scores among these universities suggests varying levels of efficiency in faculty deployment and engagement. SOA University, with the highest score, likely provides better student-faculty ratios and more effective faculty engagement in teaching and mentoring, contributing positively to the overall

educational experience. In contrast, Utkal University's lower FRU score indicates potential inefficiencies, which could result in larger class sizes, less personalized attention for students, and potentially lower academic outcomes. Improving FRU scores is crucial for enhancing the quality of university education, as it directly impacts the teaching effectiveness and learning environment within the institution.

Online Education: Online Completion of Syllabus & Exams and Swayam: OE

In the 2024 NIRF rankings, the "Outreach and Exclusivity" (OE) sub-parameter within the Teaching, Learning, and Resources (TLR) category evaluates how well universities serve diverse and underrepresented communities, considering factors like gender, geographical representation, and socio-economic diversity. A higher percentage score in OE indicates a university's strong commitment to inclusivity, which is crucial for providing equitable access to education.

Referring to Figure 1 in the "Tables" document, the percentage scores in the OE sub-parameter for three universities are as follows: Siksha 'O' Anusandhan (SOA) University scored 33%, KIIT University also scored 33%, and Utkal University matched these with a score of 33%. These scores represent the percentage obtained by each university out of the total marks allocated for OE, indicating their relatively equal performance in promoting inclusivity.

The OE score significantly influences the overall quality of university education, as it reflects the institution's ability to attract and support a diverse student body, thereby enriching the learning environment. A university that excels in this area is likely to produce well-rounded graduates who are better prepared to contribute to a diverse society. Therefore, improving the OE score can directly enhance the inclusivity and overall quality of education provided by the institution.

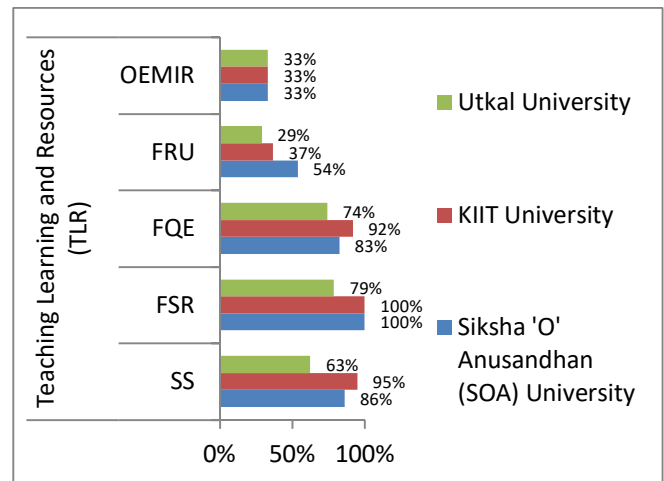


Figure 1 : Comparative Percentage Score of Universities in TLR Component.

Performance of Universities in RP Parameter

Combined Metric for Publications: PU

The Publications (PU) sub-parameter under the Research and Professional Practices (RP) component in the NIRF rankings measures the quality and quantity of research output by a university. It evaluates the number of research papers published in reputed journals, which reflects the institution's research capabilities and contributions to the academic community.

In the 2024 NIRF rankings, Siksha 'O' Anusandhan (SOA) University scored 44% in the PU sub-parameter, indicating a relatively strong research output. KIIT University followed with 39%, while Utkal University lagged significantly, scoring just 27%. These percentages represent the score each university obtained out of the total possible marks in this sub-parameter, reflecting their effectiveness in producing and disseminating research.

A higher percentage score in PU signifies a greater volume of impactful research, which directly influences the overall academic quality and reputation of a university. It highlights the institution's commitment to advancing knowledge and contributing to global academic discourse. Conversely, a lower score, as seen with Utkal University, points to the need for enhancing

research initiatives and support systems. Improving performance in this area can elevate the university's standing, attract better faculty, increase funding opportunities, and ultimately enhance the quality of education offered to students.

Combined Metric for Quality of Publications: QP

In the context of the NIRF rankings, the "QP" sub-parameter, which stands for "Quality of Publications," is a crucial metric within the Research and Professional Practices (RP) parameter. This sub-parameter measures the quality of research outputs published by an institution, based on citation indices and the impact of the published work. A higher percentage score in QP indicates a stronger research presence and higher recognition in academic circles.

In the 2024 NIRF rankings, the percentage scores for the QP sub-parameter were as follows: Siksha 'O' Anusandhan (SOA) University scored 44%, KIIT University scored 39%, and Utkal University scored significantly lower at 27%. These scores reflect the proportion of marks obtained by each university out of the total possible in this category.

A higher percentage score in QP signifies that the institution's research publications are of high quality and are recognized within the academic community, leading to a stronger reputation. For universities like Utkal, with a lower score, this suggests a need to enhance the quality and impact of their research outputs. Improving QP scores can directly influence the overall quality of university education by attracting better faculty, securing more research funding, and fostering a more rigorous academic environment, thereby elevating the institution's standing both nationally and internationally.

IPR and Patents: Published and Granted: IPR

The Intellectual Property Rights (IPR) sub-parameter within the Research and Professional Practices (RP) component of the NIRF rankings measures the ability of a university to generate patents, trademarks, and copyrights, which are

crucial indicators of innovation and research output. A higher percentage score in this parameter reflects the institution's effectiveness in producing original research that can be patented or otherwise protected, demonstrating a robust culture of innovation and knowledge generation.

In Figure 2 of the provided document, the IPR scores for three universities in Odisha are as follows: Siksha 'O' Anusandhan (SOA) University scored 0.46, KIIT University scored 0.6, and Utkal University scored 0.0. These scores are a percentage of the total marks allocated for IPR, and they indicate the comparative performance of these institutions in protecting their intellectual property.

SOA and KIIT demonstrate a moderate level of success in this area, with KIIT leading with a 60% score, suggesting a relatively strong emphasis on patenting and other forms of intellectual property. In contrast, Utkal University's score of 0% highlights a significant gap, indicating no substantial output in IPR, which could negatively impact its overall research profile and innovation capacity.

Enhancing performance in the IPR sub-parameter is crucial, as it directly influences the quality of university education by encouraging a research-driven environment, fostering innovation, and potentially attracting more funding and collaboration opportunities.

Footprint of Projects, Professional Practice and Executive Development Programs: FPPP

The FPPP indicator under the Research and Professional Practices (RP) component in the NIRF rankings assesses how effectively universities engage in projects, consultancy, and executive development activities. It measures the extent to which institutions contribute to industry and societal needs through knowledge dissemination and professional services.

Analyzing the performance of three universities—Siksha 'O' Anusandhan (SOA), KIIT University, and Utkal University—reveals varying

levels of engagement. According to the findings, SOA University get 46 % score in FPPP, indicating moderate participation in industry-related projects and professional practices. KIIT University performed slightly better, scoring 60% percentage score reflecting a higher engagement in consultancy and executive programs. Utkal University scored 0% , highlighting a significant gap in its involvement in professional development activities and external projects.

This disparity suggests that state public universities like Utkal lag significantly in fostering industry linkages and executive development programs, which are crucial for improving institutional visibility and financial stability.

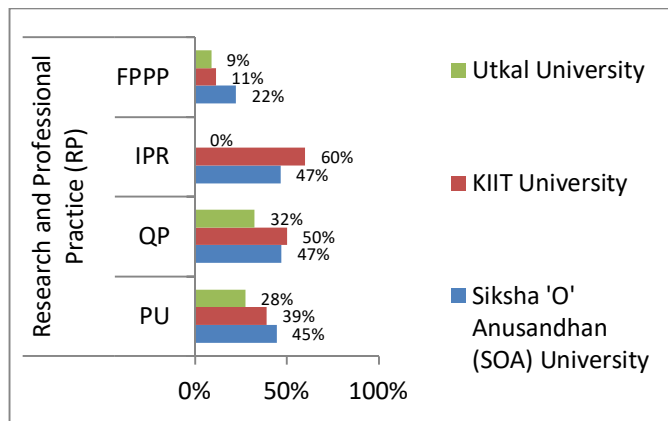


Figure 2 : Comparative Percentage Score of Universities in RP Component

IV DISCUSSION OF FINDINGS

Teaching, Learning & Resources (TLR) Parameter

The Teaching, Learning & Resources (TLR) parameter is a critical component of the National Institutional Ranking Framework (NIRF), designed to evaluate the quality of education across higher education institutions. The TLR metric assesses factors like student strength, faculty-student ratio, faculty qualifications, and the financial resources available to an institution. The findings indicate that while private institutions in Odisha, such as KIIT and SOA, perform relatively well in this parameter, public universities like Utkal University lag behind,

which raises concerns about the overall quality of education provided in these state-run institutions.

State public universities in Odisha face significant challenges in TLR metrics, particularly in sub-parameters like Faculty-Student Ratio (FSR) and Faculty Qualifications and Experience (FQE). Utkal University, for example, scored only 62% in FSR compared to 95% at KIIT University. This poor performance is indicative of overcrowded classrooms and limited access to faculty, resulting in a diminished learning experience for students. Research has shown that a lower faculty-student ratio is directly correlated with reduced academic engagement and lower student outcomes (Kapur & Murthy, 2021). This issue is compounded by Utkal's lower score in FQE (74%), which reflects a less qualified faculty base compared to private peers. The lack of highly qualified faculty undermines the university's ability to deliver cutting-edge knowledge and conduct impactful research, further diminishing the quality of education (Banerjee, 2022).

Financial Resources and Their Utilisation (FRU) is another area where public universities underperform. The FRU score highlights the efficiency of resource allocation and its impact on teaching and learning quality. Utkal University's low FRU score of 29%, compared to 53% at SOA, suggests poor utilization of available funds. Low financial utilization is a negative sign for any institution as it reflects inefficiencies in managing resources, whether it be in faculty hiring, infrastructure development, or technological investments. A well-funded institution with low utilization typically faces bureaucratic delays, administrative inefficiencies, and poor governance, which directly impact educational quality (Sharma & Jain, 2023). A study by Singh (2021) emphasizes that universities with poor financial management often struggle to maintain infrastructure, provide updated learning resources, and support innovative teaching practices, thereby eroding academic quality over time.

The disparity between private and public universities in Odisha, as reflected in the TLR scores, points to a deeper issue of governance and financial autonomy. Public universities operate under stringent regulations, which limit their flexibility in decision-making, particularly regarding faculty recruitment and financial allocations (Mishra, 2023). To bridge this gap, strategic reforms focusing on improving faculty recruitment, enhancing infrastructure, and optimizing resource utilization are crucial. Public universities must also explore alternative funding sources, such as industry collaborations and alumni contributions, to supplement government grants.

Research and Professional Practice (RP) Parameter in Odisha State Public Universities

The Research and Professional Practice (RP) parameter in the NIRF ranking framework evaluates institutions based on their research output, quality of publications, and intellectual property generation. For state public universities in Odisha, this parameter remains a significant area of concern, as reflected in the 2024 NIRF rankings. The analysis shows that while private institutions like SOA and KIIT have made strides in research and innovation, public universities like Utkal University are lagging behind, which raises critical questions about research quality, publication impact, and innovation within these institutions.

Odisha's state public universities struggle significantly in producing high-quality research. The findings reveal that Utkal University scored only 27% in the Publications (PU) sub-parameter, compared to 44% at SOA and 39% at KIIT. This disparity underscores a broader issue of insufficient research culture and inadequate infrastructure for research. A key reason for this underperformance is the lack of robust research support systems, such as well-equipped laboratories, funding for research projects, and collaborative opportunities. Studies indicate that institutions with limited research facilities are often unable to compete in terms of publication volume and quality (Bhardwaj, 2021; Kumar & Rani, 2022).

Moreover, the quality of publications remains a significant issue. The Quality of Publications (QP) sub-parameter scores highlight this concern, with Utkal University again lagging at 27%, indicating that its research outputs are less frequently cited or published in high-impact journals. This problem is exacerbated by the fact that many publications from state public universities are confined to low-tier or non-indexed journals, which do not contribute significantly to global academic discourse (Patra & Mishra, 2023). The absence of a structured approach towards encouraging publications in reputed journals like those indexed in Scopus and Web of Science diminishes the academic value and global reach of the research produced in these universities.

The quality of Ph.D. theses produced by state public universities in Odisha is also under severe scrutiny. Recent studies suggest that the supervision and review processes in these institutions are not rigorous enough, leading to subpar research outputs (Mishra & Sahoo, 2020). The high prevalence of outdated topics, limited interdisciplinary research, and inadequate peer-review mechanisms further undermine the quality of doctoral research (Rout & Mohanty, 2021). The lack of mentorship from experienced faculty and insufficient funding opportunities for Ph.D. scholars are critical factors contributing to this decline. As a result, the research produced is often not innovative or impactful enough to be published in high-quality journals, leading to low visibility and citation rates.

The Intellectual Property Rights (IPR) sub-parameter paints a bleak picture for state public universities in Odisha, with Utkal University scoring 0% in comparison to 0.46 at SOA and 0.6 at KIIT. This indicates a near-complete absence of patent filings, trademarks, or any other forms of intellectual property generation. The low output in IPR is a direct result of the lack of a culture of innovation, limited industry collaboration, and minimal awareness about the importance of protecting intellectual property (Sahoo & Tripathy, 2023). Without a strong emphasis on innovation-

driven research, these universities miss out on opportunities for commercialization, which can lead to significant economic and academic benefits.

Publishing in high-impact journals indexed in Scopus and Web of Science is crucial for enhancing the academic reputation of institutions. These platforms ensure global visibility and recognition of research work, contributing to improved citation metrics and academic influence. Odisha's public universities, however, face challenges in meeting the stringent quality criteria required for such publications. A lack of research training, limited access to cutting-edge research tools, and insufficient collaboration with leading researchers hinder their ability to produce high-quality research that meets global standards (Singh & Choudhury, 2021). For these universities to improve their standing in the RP parameter, strategic investments in faculty development, research infrastructure, and international collaborations are essential.

V RECOMMENDATIONS

Enhance Faculty-Student Ratio (FSR) with Focus on Permanent Faculty:

Public universities like Utkal University scored only 62% in FSR compared to 95% at KIIT University. It is critical to hire more permanent faculty to reduce the student-teacher ratio, ensuring personalized attention and quality learning experiences. Targeting an FSR score above 80% by recruiting qualified permanent faculty can enhance student engagement and outcomes.

Strengthen Faculty Qualifications and Experience (FQE):

Utkal University lags behind with 74% in FQE compared to SOA's 82% and KIIT's 91%. It is recommended that state public universities focus on hiring and retaining faculty with advanced degrees (PhDs) and significant industry or research experience. Programs aimed at faculty development and providing incentives for obtaining higher qualifications should be prioritized.

Optimize Financial Resource Utilization (FRU):

State public universities underperform significantly in FRU, with Utkal University scoring only 29% compared to SOA's 53%. To improve this, universities should prioritize budgeting for essential resources such as modern teaching aids, research infrastructure, and faculty development. Enhanced financial planning and monitoring mechanisms are needed to ensure that available funds are utilized effectively, directly contributing to improved learning outcomes.

Improve Online Education and Digital Learning Initiatives:

The low OE score (33% for all three universities) suggests an urgent need to strengthen online education. Public universities should focus on expanding digital infrastructure, providing access to online learning platforms like SWAYAM, and integrating blended learning models. Ensuring that a minimum of 50% of syllabus content is available online and enhancing digital literacy among students can boost the overall TLR score.

Boost Student Enrollment and Retention Strategies:

With Utkal University scoring only 62% in the SS sub-parameter, there is a clear need for public universities to enhance their student enrollment strategies. Offering more market-relevant programs, improving campus facilities, and strengthening career services are crucial. Additionally, targeted outreach to underrepresented groups and introducing scholarships can help increase the student strength and ensure higher retention rates, leading to better performance in the TLR parameter.

Recommendations for Improving RP Performance in State Public Universities in Odisha

Increase Focus on Quality Research Publications:

Utkal University's score of 27% in the Publications (PU) sub-parameter indicates the need to enhance research output. State public universities should emphasize publishing in Scopus and Web of

Science-indexed journals to improve the quality and visibility of their research. Establishing dedicated research cells, providing incentives for high-impact publications, and conducting regular workshops on research methodology can help improve both the quantity and quality of research. Setting a target to achieve at least a 40% score in PU by the next NIRF cycle can lead to enhanced academic reputation, better faculty recruitment, and increased research funding opportunities.

Enhance Research Quality through Robust Peer Review Mechanisms:

The Quality of Publications (QP) metric, where Utkal University scored only 27%, underscores the need for improving the impact of research. Introducing rigorous peer review mechanisms, encouraging faculty to collaborate with international researchers, and focusing on multidisciplinary research can significantly enhance the quality. Providing seed funding for research projects with high publication potential and offering grants for attending international conferences can further support this goal. A target of increasing QP scores to at least 40% in the next ranking cycle can elevate the overall research environment and institutional standing.

Develop Stronger IPR and Patent Culture:

Utkal University scored 0% in the IPR sub-parameter, highlighting a critical area for improvement. Universities should establish IPR cells to guide faculty and students through the patenting process, offer financial support for patent filing, and provide training on innovation and intellectual property rights. Collaborating with industries and research organizations can also boost patent applications and technology transfers. A goal of achieving at least a 25% score in IPR within the next two years would reflect a shift towards a more innovation-driven research culture.

Foster Industry-Academia Collaboration for Research and Development:

The RP performance of public universities can be significantly enhanced through stronger collaborations with industry. By setting up industry-sponsored research labs, offering consultancy services, and engaging in joint research projects, universities can increase both publication output and patent filings. Implementing structured programs for faculty to undertake industry-based research and encouraging industry experts to co-author papers can also improve RP scores. Setting a target to establish at least five industry partnerships within two years would lead to better funding, enhanced research output, and improved employability of graduates.

Improve Research Infrastructure and Funding Utilization:

Efficient utilization of research funding and better infrastructure are crucial for enhancing RP scores. Universities should prioritize setting up centralized research facilities accessible to all departments and ensure timely utilization of grants. Establishing a dedicated office for research administration that tracks funding usage, monitors project progress, and offers administrative support can streamline research processes. Aiming for a 20% improvement in infrastructure-related metrics by the next NIRF cycle would help attract more research projects, leading to higher publication output and increased patent filings.

Encourage Ph.D. Research with a Focus on Quality and Relevance:

The quality of Ph.D. theses is a key factor influencing research quality. Public universities should implement stricter admission criteria, mandate coursework in research ethics and methodology, and provide regular training on thesis writing and publication. Faculty should be incentivized to guide Ph.D. students towards publishing in high-impact journals. Establishing research committees to review thesis quality before submission can ensure that only high-quality

research is produced. Aiming for at least a 30% improvement in Ph.D. thesis robustness and publication output over the next three years would directly impact RP scores.

Promote Interdisciplinary and Multidisciplinary Research Initiatives:

Interdisciplinary research can significantly enhance publication quality and impact. Universities should establish centers of excellence that promote cross-departmental collaboration and fund projects combining diverse fields such as science, technology, and humanities. Offering seed grants for interdisciplinary research and creating a culture of collaboration through joint seminars and conferences can lead to innovative research outcomes. A target to produce at least 10 high-impact interdisciplinary publications annually would not only boost RP scores but also increase the institution's visibility and relevance in addressing complex societal challenges.

VI CONCLUSION

The analysis of the state of higher education in Odisha through the lens of the National Institutional Ranking Framework (NIRF) 2024 reveals critical insights into the performance of key state public universities, particularly across the Teaching, Learning, and Resources (TLR) and Research and Professional Practices (RP) parameters. The findings highlight significant disparities in the quality of education and research output among the universities, with public institutions like Utkal University lagging behind their private counterparts such as KIIT and SOA University. In the TLR component, factors such as inadequate faculty-student ratios, lower faculty qualifications, and underutilization of financial resources contribute to the poor performance of state universities. On the RP front, the issues are even more pronounced, with low publication quality, a negligible presence in patents and IPR, and insufficient industry-academia collaborations.

Addressing these gaps requires targeted interventions. Recommendations focus on

enhancing faculty qualifications, optimizing resource utilization, fostering a culture of quality research, and building stronger industry linkages. Initiatives like improving research infrastructure, boosting Ph.D. program quality, and promoting interdisciplinary research are crucial steps towards elevating the academic and research standards of Odisha's public universities. The path forward lies in implementing these strategies systematically, with a commitment to continuous monitoring and improvement. By aligning resources, policies, and practices with the outlined recommendations, state public universities in Odisha can not only improve their NIRF rankings but also contribute meaningfully to the broader goals of higher education—promoting innovation, inclusivity, and excellence.

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