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An Analytical Study Of The Top Ten NIRF Ranked IIT's With Special Reference To Indian Research Information Network System (IRINS)

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The Indian Institute of Technology (IITs) are known for their quality in technical education and research. IIT Madras, IIT Delhi and IIT Bombay secured the top three spots in the 2024 NIRF ranking displaying their steady achievement across a range of academic and research criteria. A main factor contributing to their success is the Indian Research Information Network System (IRINS), developed by INFLIBNET centre. In order to increase research exposure and facilitate international benchmarking, IRINS acts as single platform for managing faculty research profiles, publications and collaborations. In this study examined influence of IRINs on the top ten IITs in the NIRF 2024 ranking. The study looks at departmental contributions, faculty publications, Faculty publication, patents and h-index using information from NIRF and INRINS website. Result shows that research output and institutional success are strongly correlated with IIT Delhi leading in publications and IIT Madras leading in patents. The study also emphasizes the important contributions made by departments like physics, which dominate the research output across IIT's research ecology and assisting them in achieving academic excellence and worldwide recognition.

Key Words: Indian Research Information Network System, National Institutional Ranking Framework, Research output, researchers profile, Citation, H Index, Research and Publication.

Introduction:

The Indian Institute of technology is one of India's leading institution, Famous for their excellence in technical education, innovation and research.IIT Madras, IIT Delhi and IIT Bombay achieved the top three spots in the 2024 NIRF ranking, which reflects their steady achievement in a number of areas like outreach, teaching and research. Effective strategies for faculty participation and research visibility are necessary to maintain this excellence. One Such initiative is the Indian Research Information Network System (IRINS) developed by

INFLIBNET center, which enhances the visibility and impact of research output from Indian Institutions (INFLIBNET, 2024).

IRINS provides a centralized platform for managing research profiles, publications and collaborations enabling institutions to benchmark their performance globally. By integrating data from sources like Scopus. Web of Science and institutional repositories, IRINS facilitates improved research transparency and knowledge dissemination (Jayaraj, 2018). For The top ten ranked IIT's IRINS plays a vital role in strengthening faculty productivity, enhancing research collaboration and improving Institutional rankings. The main purpose of the study is to analyze the top ranked IIT's in the 2024 NIRF list with special reference to the implementation of IRINS.The paper examines how IRINS supports these institutes in Improving research visibility global standing and academic excellence while contributing to their sustained success.

Review of Literature:

B. Jeyapragash and A. Muthuraj (2021) study Highlights the systems role in associating faculty profiles, research publications, projects and achievements to promote collaborative opportunities and institutional ranking. Studies underscore IRINS as a tool for aligning institutional research abilities with global standards, emphasizing its integration with existing frameworks like NIRF for improving national rankings. However, challenges such as data accuracy, faculty engagement and system adoption remain key areas for improvement. Addressing these challenges can optimize IRINS's potential in development academic transparency and institutional excellence.

Tyagi, Sunil and Songh, Jasbir (2021) Studies faculty contributions, Scholarly publications, h-index and citations, across departments and institutions, highlighting IRINS role in enhancing research visibility and collaboration. The study reveals significant gap among IITs in research metrics, with institutions like IIT Bombay and IIT Delhi leading in Faculty numbers and Scholarly resources. The Study highlights the impact of Institutional and technological factors on IRINS implementation and success.

Kumaren Siva (2019) study on NIRF universities publications revealed that top 10 Universities contributed more to Scopus 53.86 % Followedd by Web of Science 41.13 % and Indian Citation Index 5 %. The University of delhi had the higest number of Citations and a high citation rate. The Study recommends incorporating additional parameters for ranking universities.

Balasubramani, Jeyapragash and Thangavel, Rajkumar, (2019) examined a study on IIT Publications indexed in research Gate, Scopus, Web of science and Indian Citation Index Databases. They used data from the National Institutional Ranking Framework and Research Gate.The Study found that 46,729 publications ate available in ResearchGate, while 47,380 are in Web of science, Scopus and Indian Citation Index Database.

Sivakumaren, K.S (2017) conducted a study on NIRF ranked IIMS on the publications of the indexed in Scopus, web of science and Indian Citation Index database. The study found that 939 publications have been indexed in these databases with 203 papers highly cited by study found that 939 publications have been indexed in these databases with 203 papers highly cited by others. Scopus indexed the most publications 65.50 % followed by web of Science 20.55 % and Indian Citation index 13.95 %. The Study also found that old institutes produces more publications than recently established.

Cherkpdan Surendran, Sheeja, N.K. and Susan Mathew, K (2017) The purpose of the study on the link between Scholarly communication and institutional ranking using the NIRF.Analyzed parameters of two International ranking. The findings highlight the importance of effective scholarly communication in enhancing academic productivity

Arora, Jagdish and Trivedi Kruti (2014) article highlights the importance of university ranking systems, including the I-UGR system developed for ranking universities in Spain. The system's formula and indicators are highlighted, and the authors suggest that the I-UGR system could be applied to ranking universities in India, highlighting the shortcomings of existing systems.

Research Methodology:

The data were collected from National Institutional Ranking Framework (NIRF) home page (https://www.nirfindia.org/Home) and Indian Research Information Network System (IRINS) website (https://irins.org/irins/index.php) as on 3rd week of August 2024. It is found that 16 Indian Institute of Technology institutes have got score in NIRF 2024. The study is also aimed to analyze Top 10 NIRF ranked Indian Institutes of Technology (IIT) institutes faculty member's publications, patents, Resource Impacts, top departments and top faculty publication & citations of individual institution. The collected data were classified, analyzed and tabulated by using simple statistical methods. The study emphasizes understanding the role of research output and visibility facilitated by platforms like IRINS in strengthening institutional performance in NIRF rankings.

Objectives of the Study:

The following are the major objectives of the study.

1. To identify the 2024 NIRF ranked Indian Institute of Technology (IIT's).
2. To identify the Top 10 NIRF 2024 ranked IITs IRINS profile.
3. Contribution of top department of individual institution publication and h index.
4. To identify top faculty members of individual institution and publications & Citations.
5. Top faculty members of individual institution and publication and citations.

Data Analysis and Interpretation:

Table 1.

2024 NIRF Ranked IIT's			
Sr.no	**Institute Name**	**Score**	**NIRF Rank 2024**
1	Indian Institute of Technology Madras	89.46	1
2	Indian Institute of Technology Delhi	86.66	3
3	Indian Institute of Technology Bombay	83.09	4
4	Indian Institute of Technology Kanpur	82.79	5
5	Indian Institute of Technology Kharagpur	76.88	6
6	Indian Institute of Technology Roorkee	76	8
7	Indian Institute of Technology Guwahati	71.86	9
8	Indian Institute of Technology Hyderabad	71.55	12
9	Indian Institute of Technology Varanasi	66.69	30
10	Indian Institute of Technology Indore	64.72	33
11	Indian Institute of Technology Gandhinagar	63.42	29
12	Indian Institute of Technology Ropar	61.56	48
13	Indian Institute of Technology Jodhpur	60.61	68
14	Indian Institute of Technology Mandi	59.86	72
15	Indian Institute of Technology Patna	58.4	66
16	Indian Institute of Technology Bhubaneswar	52.54	73

The 2024 NIRF Rankings for IITs show IIT Madras retaining its top position with the highest score of 89.46, followed by IIT Delhi (86.66) and IIT Bombay (83.09). IIT Kanpur and IIT Kharagpur secured 4th and 5th positions, respectively, showcasing consistency in performance. Notably, IIT Roorkee and IIT Guwahati performed well, securing ranks 6 and 7, respectively. Lower-ranked IITs, such as IIT Patna (58.4) and IIT Bhubaneswar (52.54), reflect areas for improvement. Significant rank changes include IIT Varanasi, which moved to rank 30, and IIT Jodhpur, which climbed to 61 from a lower position last year. Overall, older IITs dominate the top 10, while newer ones like IIT Ropar and IIT Mandi show steady progress.

Table 2

Top 10 NIRF 2024 ranked IITs IRINS profile						
Sr. No	**Institute Name**	**NIRF Rank**	**NIRF Score**	**Faculty**	**Total Publication**	**Patent**
1	Indian Institute of Technology Madras	1	89.46	695	37479	982
2	Indian Institute of Technology Delhi	3	86.66	775	42853	615
3	Indian Institute of Technology Bombay	4	83.09	703	35994	883
4	Indian Institute of Technology Kanpur	5	82.79	507	25012	417
5	Indian Institute of Technology Kharagpur	6	76.88	690	37912	270
6	Indian Institute of Technology Roorkee	8	76	458	21523	65
7	Indian Institute of Technology Guwahati	9	71.86	454	24848	247
8	Indian Institute of Technology Hyderabad	12	71.55	340	11328	113
9	Indian Institute of Technology Varanasi	30	66.69	410	17586	67
10	Indian Institute of Technology Indore	33	64.72	223	10113	28

The table provides an overview of the top 10 IITs based on NIRF 2024 rankings, along with key metrics from their IRINS profiles**. IIT Madras** ranks first with the highest score of **89.46** and leads in patents 982, showcasing its research excellence. IIT Delhi, ranked third, has the highest number of faculty 775 and total publications 42,853, reflecting its academic productivity. IIT Bombay and IIT Kharagpur also perform well in publications and patents, with scores of 83.09 and 76.88, respectively. IIT Kanpur, despite having fewer faculty 507, contributes significantly with 25,012 publications and 417 patents. IIT Guwahati and IIT Roorkee show balanced performance, but their patent counts 247 and 65, respectively are relatively low. IIT Varanasi, Hyderabad, and Indore, with lower faculty strength and publications, indicate potential for growth. Overall, the data highlights how faculty strength, research output, and patents correlate with institutional performance.

Table 3

Contribution of top department of individual institution and h index				
Department	**Name of the Institute**	**Pub**	**H Index**	**Rank**
Department of Physics	Indian Institute of Technology Bombay	3008	161	1
Department of Physics	Indian Institute of Technology Madras	4615	156	2
Department of Physics	Indian Institute of Technology Indore	2060	113	3
Department of Chemistry	Indian Institute of Technology Varanasi	1871	111	4
Department of Physics	Indian Institute of Technology Guwahati	3106	110	5
Mechanical and Industrial Engineering	Indian Institute of Technology Roorkee	2612	87	6
Department of Biological Sciences and Bioengineering	Indian Institute of Technology Kanpur	1259	77	7
Department of Computer Science and Engineering, Indian Institute of Technology Indian Institute of Technology Kharagpur	Indian Institute of Technology Kharagpur	3814	76	8
Department of Electrical Engineering Indian Institute of Technology Delhi,	Indian Institute of technology Delhi	3038	56	9
Department of Materials Science and Metallurgical	Indian Institute of Technology Hyderabad	801	47	10

The Department of Physics at IIT Madras leads the list with 4615 publications, contributing 17.63% of the total articles and achieving an h-index of 156. This reflects the department's significant research productivity and impact. In following place, the Department of Computer Science and Engineering at IIT Kharagpur has contributed 3814 publications, accounting for 14.57% of the total articles, with an h-index of 76. The Department of Physics at IIT Guwahati ranks third, having published 3106 articles 11.86 % with an h-index of 110. At the other end of the spectrum, the Department of Materials Science and Metallurgical at IIT Hyderabad ranks last among the top 10, with 801 publications contributing only 3.06% of the total and h-index of 47. Physics departments dominate the rankings, holding four of the top ten spots, indicating their strong research performance across multiple IITs. Other departments, such as Electrical Engineering at IIT Delhi Rank 4, 3038 articles, h-index 56 and Chemistry at IIT Varanasi Rank 8,1871 articles, h-index 111, also demonstrate notable contributions. The wide range of publication counts, percentage contributions, and h-indices underscores the diversity in research productivity and impact among departments and institutions.

Table-4

Top faculty members of individual institution and publications & Citations					
Name of the Faculty	**Name of the Institute**	**Publications**	**H-index**	**Crossref Citations**	**Rank**
Dr Basanta Kumar Nandi	Indian Institute of Technology Bombay	758	136	54565	1
Prof Prafulla Kumar Behera	Indian Institute of Technology Madras	1426	128	56234	2
Prof Raghunath Sahoo, FNASc, FInstP	Indian Institute of Technology Indore	1057	118	40842	3
Prof Bipul Bhuyan	Indian Institute of Technology Guwahati	797	101	28030	4
Prof Mumtaz Quraishi	Indian Institute of Technology Varanasi	556	97	27589	5
Prof Bhim Singh	Indian Institute of Technology Delhi	3167	80	26513	6
Prof Chennupati Jagadish	Indian Institute of Technology Hyderabad	1214	72	20619	7
Prof Ashok Kumar	Indian Institute of Technology Kanpur	616	59	14375	8
Dr Sudip Misra	Indian Institute of Technology Kharagpur	581	50	10058	9
Dr Anil Kumar	Indian Institute of Technology Roorkee	751	42	7802	10

The table highlights the top faculty members across various IITs based on their academic achievements, measured by publications, H-index, and Crossref citations. Dr. Basanta Kumar Nandi IIT Bombay ranks first with 758 publications, an H-index of 136, and 54,565 citations. Prof. Prafulla Kumar Behera, IIT Madras follows closely with the highest publications 1,426 and 56,234 citations, showcasing strong research impact. Prof. Raghunath Sahoo, IIT Indore ranks third, emphasizing significant contributions with an H-index of 118. Faculty from IIT Delhi has the highest publication count 3167, but their relatively lower H-index 80 affects their rank. Other notable contributors include Prof. Bipul Bhuyan IIT Guwahati and Prof Mumtaz Quraishi, IIT Varanasi, maintaining strong H-indices and citation counts. The table reflects that research output, impact H-index, and citations collectively influence ranking, highlighting IIT Bombay and IIT Madras's leading positions. Lower-ranked faculty generally show fewer publications and lower H-indices, underscoring the importance of consistent, impactful research output.

Major findings:

IIT Madras ranks #1 in NIRF 2024, excelling in patents 982, while IIT Delhi leads in publications 42,853 and faculty strength 775. Older IITs dominate the rankings, but newer IITs like Ropar and Mandi show significant growth potential. Physics departments lead in research contributions, with IIT Madras achieving the highest h-index 156. Top faculty like Dr. Basanta Kumar Nandi IIT Bombay and Prof. Prafulla Kumar Behera IIT Madras have strong research impact through high citations. IRINS enhances research visibility by centralizing faculty profiles and facilitating global benchmarking. Diverse performance across departments highlights opportunities for interdisciplinary and emerging research areas.

Conclusion:

The Implementation of IRINS has significantly contributed to the research visibility and global standing of the top ranked IITs. Older institutions maintain dominance due to their established research ecosystems, while newer IITs Show promise in specific areas. Faculty and departmental contributions reveal that research impact is not only dependent on publication count but also on citation and h-index metrics.

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