

Short Note

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Short Note

Weighing Faculty Research Contribution in Institutional Growth and Incentivization

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Abstract: Institutional rankings significantly influence higher education, research funding, and faculty incentives. In the Indian Ranking System (NIRF - Engineering Category), research parameters contribute 22.5%, directly impacting funding eligibility and institutional growth. Institutions struggle to quantify faculty research contributions for ranking and funding purposes. A standardized framework is required to evaluate and incentivize research outputs fairly. This study proposes a method for assigning weightage to authorship positions in collaborative publications, ensuring accurate faculty contribution assessment. To develop a fair and transparent author weightage system that supports institutional ranking calculations and incentive structures. A proportional weightage system is introduced, where the primary corresponding author and first author receives 50% credit, and the rest is distributed among co-authors. An incentive model based on journal quartiles and collaboration levels is proposed. The framework allows institutions to evaluate faculty contributions systematically, aiding in ranking, funding, and incentives. Future modifications can integrate SDG-focused research, corporate collaborations, and international partnerships for enhanced impact.

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I. Introduction

The role of research in shaping institutional rankings and funding eligibility has gained immense importance in higher education [1]. Both global and national ranking systems influence the reputation and competitiveness of institutions [2]. In India, the National Institutional Ranking Framework (NIRF) assigns a weightage of 22.5% to research-related parameters, including Publication Unit (PU) and Quality of Publication (QP). Additionally, research metrics significantly contribute to the Footprint of Projects and Professional Practice (FPPP) parameter (3%), Financial Resources and their Utilization (FRU) (9%), Ph.D Students Graduated (4%), and peer perception (10%), making up a total of 45.5% in the NIRF Engineering category [3].

A strong faculty research profile directly influences institutional rankings, research funding opportunities, and overall academic excellence. However, many institutions struggle to effectively assess and quantify faculty research contributions. This research note provides a structured approach for institutions to evaluate faculty research output based on publication weightage and outlines a fair incentive distribution model to encourage research activities.

II. Faculty Contribution to Institutional Research

To quantify faculty research contributions, an appropriate weightage model is necessary. A major proportion (50%) of the total weightage is assigned to the primary corresponding author or first author, while the remaining 50% is distributed among all other co-authors.

A. Case 1

If all authors belong to the same institution, the publication weightage is distributed as follows. First author 25%, Primary Corresponding Author 25% and remaining authors share the remaining 50%. For example, if an article has four authors from the same institution, and the fourth author is the primary corresponding author, the weightage is: First Author: 0.25

Second Author: 0.25

Third Author: 0.25

Fourth Author (Primary Corresponding Author): 0.25

Total Institutional Claim: 1

B. Case 2

If an article has multiple authors from different institutions, the contribution of each institution is determined by the position of its affiliated author(s). For instance, if an article has seven authors from seven different institutions, and the home institution's author holds the sixth position (not as the primary corresponding author), the institutional claim is 0.083.

$$AC = f(AP, CA, FA, N) = \begin{cases} 0.25, & \text{if } AP = CA \\ 0.25, & \text{if } AP = FA \\ \frac{N-1}{0.5}, & \text{otherwise} \end{cases} \quad (1)$$

where,

AC = Author Claim,

AP = Author Position,

CA = Primary Corresponding Author,

FA = First Author,

N = Number of institutions in the article.

In general, all institutions consider an author's contribution to be 1 for publishing a single article. If weightage is calculated this way, institutions can easily assess faculty members' contributions to the institution.

C. Case 3

If an article has four authors, with two authors belonging to the home institution in the first (corresponding) and second author positions, their contributions are calculated using the formula above for individual authors. Finally, their contributions are summed to determine the article's claim toward the institution's weightage.

First author's claim toward institution weightage = 0.5

Second author's claim toward institution weightage = 0.167

Total article claims toward institution weightage = $0.5 + 0.167 = 0.667$

D. Case 4

If an article has three authors, with all three of them belonging to the home institution, and second author as the corresponding author then their contributions are calculated as below.

First author's claim toward institution weightage = 0.375

Second author's claim toward institution weightage = 0.375

Third author's claim toward institution weightage = 0.25

Total article claims toward institution weightage = $0.75 + 0.25 = 1$

Three different cases have been explained here, and similar calculations can be extended to other cases. Below is a table presenting weightage calculations for various scenarios.

Table 1. CALCULATION OF AUTHOR WEIGHTAGE FOR PUBLICATION CONTRIBUTION TO THE HOME INSTITUTION.

Article	TA	AP	Home	Others	FA	CA	N	AC
A1	4	3	1	3	No	No	4	0.167
A2	4	1	2	2	Yes	Yes	3	0.5
	4	2	2	2	No	No	3	0.167
A3	7	6	1	6	No	No	7	0.083
A4	4	1	4	0	Yes	No	1	0.25
	4	2	4	0	No	No	1	0.25
	4	3	4	0	No	No	1	0.25
	4	4	4	0	No	Yes	1	0.25

Legend: TA: Total Authors, AP: Author Position, FA: First Author, CA: Primary Corresponding Author, N: Number of Institutions, A: Article

III. Calculating Research Incentives

To motivate faculty towards research, institutions can provide financial incentives. The ceiling for research incentives can be set as the average salary of a Professor (\$) per month, with varying incentives based on publication quartile and type.

Table 2. CEILING OF RESEARCH INCENTIVE ACROSS EACH PUBLICATION CATEGORY.

Article	Quartile	Incentive (Ø)
WoS (Journal)	Q1	\$
WoS (Journal)	Q2	\$ - (15% of \$)
WoS (Journal)	Q3	\$ - (30% of \$)
WoS (Journal)	Q4	\$ - (40% of \$)
Authored Book (Scopus)	-	\$ - (50% of \$)
Edited Book (Scopus)	-	\$ - (75% of \$)
Scopus (Journal)	Q1	\$ - (80% of \$)
Scopus (Journal)	Q2	\$ - (82% of \$)
Scopus (Journal)	Q3	\$ - (84% of \$)
Scopus (Journal)	Q4	\$ - (86% of \$)
Book Chapter (Scopus)	-	\$ - (88% of \$)
Conference (WoS)	-	\$ - (90% of \$)
Conference (Scopus)	-	\$ - (92% of \$)

A. Weightage for Incentive Calculation

To ensure fair compensation for collaborative publications, the incentive amount is distributed based on institutional affiliation.

$$\text{Incentive Amount for Author} = \frac{(AC * \emptyset)}{N}$$

Where:

AC = Author Claim (as calculated in equation 1),

\emptyset = Eligible incentive amount for the article (from Table 2),

N = Number of institutions in the article.

The reason for dividing by the number of institutions is to encourage the home institution to prioritize full-time research scholars, which, in turn, brings more investment in research facilities. This approach does not discourage collaboration with external institutions.

Institutions may also introduce special incentives for publications aligned with Sustainable Development Goals (SDGs), international collaborations, and academic-corporate partnerships. Also, there are a few institutions that prioritize open access and subscription-based publication differently. If so, they are free to adjust the incentive parameters based on the APC category.

IV. Conclusion

The proposed author weightage model provides a transparent method for institutions to evaluate faculty research contributions in a structured manner. By implementing such a system, institutions can effectively track research output, enhance faculty recognition, and allocate research incentives strategically. This model not only aids in improving institutional rankings but also fosters a research-driven academic environment by rewarding faculty equitably based on their scholarly impact.

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Author Biography



Palanichamy Naveen Received a B.E. in Electronics and Communication Engineering from Arulmigu Kalasalingam College of Engineering, [now Kalasalingam Academy of Research and Education] (Anna University, Chennai) in 2009. He obtained an M.E. in Power Electronics and Drives from Sri Sivasubramaniya Nadar College of Engineering (Anna University, Chennai) in 2011. In 2022, he completed his Ph.D. in Electronics and Communication Engineering (Specialization: Computer Vision and Machine Learning) from Kalasalingam Academy of Research and Education. School Topper and Rank Holder in 10th and 12th through State Board, passed out in 2003 and 2005, respectively. He has about 13 years of teaching experience at various levels and is currently holding the responsibility of NIRF Coordinator at Dr.N.G.P. Institute of Technology, India. He is a recognized Ph.D. Supervisor at Anna University Chennai under Faculty of Electronics and Communication Engineering. Prior to joining Dr.N.G.P. Institute of Technology he was associated as Coordinator Sponsored Research in the Centre for Research and Development, at KPR Institute of Engineering and Technology, Coimbatore, India. He is also Visiting Researcher at University of Hradec Kralov' e, Czech Republic. He was associated as' NIRF Co-ordinator at Sri Eshwar College of Engineering for 2 years and also served as Assistant Director - Accreditation and Ranking at Kalasalingam Academy of Research and Education. His research interests include Computer Vision and Machine Learning. He received the best faculty award from Kalasalingam Academy of Research and Education in the year 2019. He published an authored book titled "Understanding the Metaverse and its Technological Marvels: Beyond Reality" and "Digital Twins and Cybersecurity". He has published around 50 papers in International Journals and Conferences. He also published 4 patents. He is presently an Associate Editor in the PLOS One (Q1), AD ALTA-Journal of Interdisciplinary Research, also he serves as an Associate Editor in Journal of Intelligent and Fuzzy Systems (20232024). He currently serves as an Editorial Board member for the Nature - Scientific Reports (Q1), International Journal of Interactive Multimedia and Artificial Intelligence (Q2), ADCAIJ: Advances in Distributed Computing and Artificial Intelligence Journal, International Research Journal of Multidisciplinary Technovation (IRJMT), Discover Imaging and Journal of Current Science and Technology. He has also been serving as a review board member for peer-reviewed journals. In addition to his regular academic activities, he has played a vital role in various Accreditation processes (ABET, NBA, NAAC, UGC, AICTE), Ranking activities (NIRF, THE World University Rankings), Placement Activities (Placement Coordinator), examination cell duties (Valuation Centre incharge), and Institution admission procedures (Overall Admission Coordinator). He has reviewed 300+ articles for reputable journals and conferences. Additionally, he has completed more than 21 Professional Certifications from various platforms such as NPTEL, Coursera, HP, and IEEE. He is a certified translator for online courses organized by

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