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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.

Keywords: Institutional Research Weightage, Author Contribution, Faculty Incentives, Collaborative Publications

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.

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.

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

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.

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

Where,

- **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.

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

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 Second 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

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 $)

Weightage for Incentive Calculation

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

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

Where:
AC = Author Claim (as calculated in equation 1),
Ø= 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.

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.

Declarations

- Credit authorship contribution statement
- Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaring the Use of Generative AI

This manuscript was refined with the assistance of AI-based tools for grammar correction and improving the article's flow. All intellectual content, analysis, and conclusions remain the author's original work.

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Data Availability

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