

DESIGNING A NATIONAL AND INTERNATIONAL RATING SYSTEM TO ANALYZE THE RESEARCH ACTIVITIES OF UNIVERSITY PROFESSORS AND TEACHERS

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Abstract: Participation in national and international rankings reflects a university's influence and competitiveness. Leading rankings evaluate universities' quality based on the publishing activities of their faculty. This paper analyzes the design of systems for assessing the research performance of university faculty and proposes a structural and functional model for a ranking system that incorporates research productivity, digital skills, and scientometric indicators.

The developed model ensures systematic monitoring of research transparency and effectiveness. Key metrics from databases like Scopus, Web of Science, and Google Scholar form the basis of research performance evaluation. These indicators collectively assess faculty productivity and their contribution to the university's overall research impact.

The study describes the first phase of implementing the "Structural Units Transparency Rating," including experimental ranking outcomes. Findings highlight the system's role in improving the visibility and dissemination of research outputs while supporting faculty in achieving higher ranking scores. The model fosters faculty engagement in international academic networks, enhancing the university's position in global and local rankings.

Keywords: publishing activity, scholar profile, scient metric databases, ranking system, research activity, research competence, digital skills

1. Introduction

The primary goal of any university is to deliver high-quality educational services, enhance its competitiveness in the academic landscape, and attract talented students. Participation in both international and national rankings serves as a vital mechanism to assess a university's competitiveness. Leading ranking systems evaluate the quality and transparency of universities by analyzing indicators such as the publishing activity of researchers.

Global rankings, such as the "Academic Ranking of World Universities" (ARWU), "QS World University Rankings," "Webometrics," and the "Transparent Ranking: Top Universities by Google Scholar Citations," as well as Uzbekistan rankings like the "University Ranking by Scopus Indicators," "Top-100 Uzbekistan," incorporate key metrics, including citation quality in Google Scholar and reputable scientific journals [1].

To ensure effective representation in both international and national rankings, it is essential to develop and implement a robust rating system. This system should facilitate the analysis of university faculty's research activities, monitor their effectiveness, and provide actionable insights to improve transparency, accessibility, and dissemination of research outputs. Furthermore, it should foster engagement with international academic networks to promote collaboration and increase the visibility of research contributions.

The aim of this study is to create a structural and functional model for a rating system that evaluates the research activities of university faculty. This model will focus on key indicators related to research productivity and digital competencies, enabling comprehensive analysis and improvement of faculty performance in alignment with ranking criteria.

2. Analysis of University Faculty's Research Activities in the Higher Education Landscape of Asia:

The analysis of faculty research activities in the global and national higher education spaces highlights the importance of using scientometric and bibliometric systems. Uzbek universities can adopt this approach to implement an effective system for evaluating faculty performance.

It is crucial to align research performance indicators with modern requirements and international standards. Active profiles on platforms like Google Scholar, ORCID, and ResearchGate improve the visibility of publications and increase citation counts.

For Uzbek universities, creating a centralized system such as "Bibliometrics of Uzbekistan," which integrates data from Scopus, Web of Science, and Google Scholar, would be highly beneficial. This system would enable the evaluation of universities' research productivity by analyzing metrics such as h-index, citation counts, and publication output.

Open profiles in scientometric databases provide Uzbek researchers with an opportunity to showcase their work within the global academic community. Such a system enhances the competitiveness of universities in international rankings and expands opportunities for academic collaboration. The design and implementation of information systems for analyzing faculty research activities, as demonstrated by Spivakovskiy et al. [16], can be adapted for Uzbekistan. For example, a system could compile faculty rankings based on citation metrics from Scopus, Web of Science, Google Scholar, and other databases. Rankings could be structured at the departmental or institutional level, fostering transparency and incentivizing higher academic output.

By adopting such systems, Uzbek higher education institutions can enhance the visibility, transparency, and impact of their academic activities, aligning with international benchmarks and improving their competitive standing in global and regional rankings.

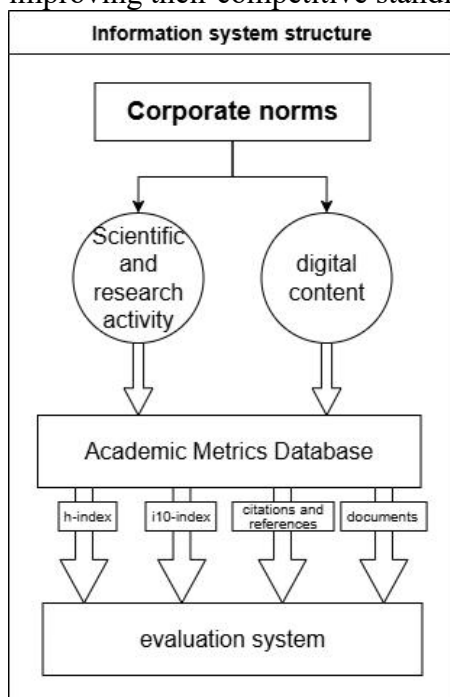


Figure 1: Correlation between the corporate standard of research activity of employees of the National University of Uzbekistan and the corporate digital competence standard through the new information system.

Analyzing the experience of developing a rating system for analyzing the activity of university teachers, it was determined that the most common quantitative indicators of the evaluation of scientific research activities are publications in journals included in authoritative scientific-metric databases; values of citation indices in scientific databases - Scopus, Web of Science, Google Scholar and others [20].

3. Research results

3.1. Structural and functional model of the rating system for analyzing the research activities of university teachers

The most important scientometric databases that indicate the effectiveness of the research activities of university teachers are Scopus, Web of Science and Google Scholar, in which bibliographic citation values are used as quantitative indicators of assessment and analysis. At the same time, it is important for university teachers to comply with the Corporate Standard of Research Activity and the Corporate Standard of Digital Competence, as the level of research and digital competence directly affects the quality of research and therefore the university's ranking in international and local rankings. That is why the basis of the model of the rating system for the analysis the research activity of the university teachers are these three scientometric databases.

Table 1 Comparative table of scientometric indicators in the profile of scientists

Metrics	Scopus SciVal	Web of Science	Publons InCites	Google Scholar	ResearchGate
1 Number of publications	+	+	+	+	+
2 Citation	+	+	+	+	+
3 h-index	+	+	+	+	+
4 i10-index	-	-	-	+	-
5 Average citation value	-	-	-	-	-
6 Altmetric indicators (recommendations, readings)	-	-	-	-	+
7 Without self-citation	+	+	+	-	-
8 Visualization	+	+	+	+	+
9 Analysis of indicators	+	+	+	-	-
10 Reports	+	+	+	-	-
11 Making connections	+	+	+	-	-

The rating system designed to evaluate the research activities of university faculty serves several key functions:

✚ **Informational:** Establishes a unified database of metrics to assess the quality and effectiveness of faculty research activities.

✚ **Visualization:** Provides data in a clear, visual format to enhance comprehension and facilitate reporting.

✚ **Motivational:** Promotes a healthy competitive environment, encouraging the activation and growth of the university's scientific potential.

✦ **Competence-Building:** Encourages faculty members to create, maintain, and regularly update their profiles in scientometric databases.

✦ **Analytical:** Examines the current state of research at both departmental and institutional levels, identifies factors influencing research productivity, and analyzes relationships between these factors.

✦ **Forecasting:** Identifies potential areas for growth and outlines strategies to enhance the effectiveness of research activities among faculty.

✦ **Managerial:** Provides a solid informational foundation to support data-driven decision-making at the management level.

3.2. Methodology for developing a transparency rating and its construction.

Based on the presented model, a rating has been developed, which is one of the indicators of the system's efficiency. As a result of the experimental implementation, a "Transparency Rating of Structural Units" was developed based on citation indicators in Google Scholar, in which the publishing activities of teachers were ranked by indicators (Fig. 4).

The proposed model of the rating system is implemented as a web client-server architecture. When developing the server software, the PHP programming language was used using the MVC architectural model. The web user interface is implemented using HTML, CSS and JavaScript.

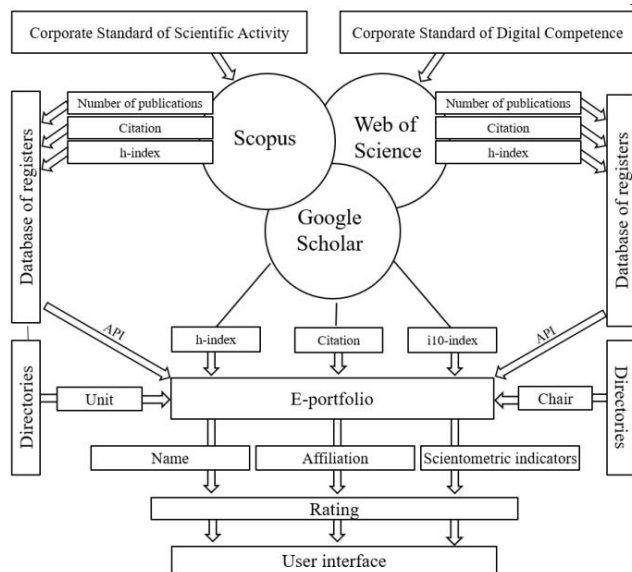


Figure 3: The Technological Framework of the Structural-Functional Model for Evaluating University Faculty Research Activities

The list of teachers by department is displayed in descending order of the total number of bibliographic publications in Google Scholar (Figure 4). A detailed table of scientific performance indicators includes the total number of bibliographic references, h-index, i10-index, and link values to the profile in Google Scholar.

The creation of a database of scientific profiles of researchers in Google Scholar made it possible to identify incorrectly formed profiles in one place.

1. Faculty of Information Technology and Management (Citation on 1 NPP - 137.21, total citations - 7958)

+ Department of Computer Science and Mathematics

(Citation on 1 NPP - 175.87, total citations - 4045)

+ Department of Finance and Economics

(Citation on 1 NPP - 169.56, total citations - 1526)

+ Department of Management

(Citation on 1 NPP - 127.64, total citations - 1787)

+ Department of Information and Cyber Security

(Citation on 1 NPP - 50, total citations - 600)

2. Faculty of History and Philosophy (Citation on 1 NPP - 83.32, total citations - 3916)

+ Research Institute of Archeology

(Citation on 1 NPP - 233.8, total citations - 1169)

+ Department of Philosophy

(Citation on 1 NPP - 88.86, total citations - 1866)

Figure 4: "Transparency rating of structural units" based on citation metrics in google scholar
In order to further analyze the rating positions and indicators of the research activity of university professors and teachers, to create visual reports on the effectiveness of research activities, it is planned to implement the 2nd stage of the study - expanding the rating by other indicators presented in the model - number. Publication and citation indexes in Scopus databases and Web of Science, establishing links to increase the publishing activity of university teachers. According to the research results, the optimal format for presenting findings has been identified. The following measures are recommended to enhance the evaluation of university faculty's research activities:

- ✚ Ensuring the openness, transparency, and accessibility of research outcomes;
- ✚ Prioritizing publications and assigning unique DOI identifiers to articles, which simplify identification and provide permanent links regardless of changes to the publication's web address;
- ✚ Creating profiles in scientific and bibliometric databases such as Google Scholar, ResearchGate, and Mendeley, and regularly updating them with new research contributions;
- ✚ Utilizing the ORCID researcher identifier to accurately link articles to their respective authors;
- ✚ Implementing promotional strategies to improve visibility and accessibility in the international online scientific community.

Additionally, efforts are underway to enhance and expand Scopus rankings using various indicators. The Web of Science platform has been fully integrated into the rating system model to enable comprehensive analysis. This includes dynamic visualization of the university's research potential, supported by advanced statistical and analytical tools.

Conclusion

For Uzbek universities to succeed in international and national rankings, it is crucial to systematically monitor and analyze the research activities of faculty members. This requires the development and implementation of a rating system based on three key scientometric databases: Scopus, Web of Science, and Google Scholar. The system performs essential functions such as information management, visualization, motivation, competence building, analytics, forecasting, and management.

In the initial phase of the study, the "Transparency Rating of Structural Units" was implemented using citation metrics from Google Scholar. The results provided recommendations to improve the quality of research activities and promote the dissemination of research outcomes

internationally. This rating system enables real-time monitoring of scientific activities, offering dynamic visual analysis and statistical insights.

Future work involves integrating additional research indicators, implementing real-time updates to the rating system, and incorporating advanced business intelligence tools for enhanced visualization and data analysis. Ensuring open access to research results and increasing their visibility on digital platforms will help optimize the representation of faculty research activities, foster professional growth, and positively impact the scientific reputation of Uzbek universities.

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