

Lecture Notes in Educational Technology

Francisco José García-Peñalvo
Alicia García-Holgado *Editors*

Proceedings TEEM 2022: Tenth International Conference on Technological Ecosystems for Enhancing Multiculturality

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Methodological Approach to the Evaluation of Scientific Journals

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Abstract. Scientific journals are the main instrument for communicating research results. The main objective of this study is to share the advances of the doctoral thesis that is being achieved on the different models used by organizations and publication platforms to classify the quality of scientific journals. A bibliographic and documentary review has been carried out oriented towards journal evaluation policies. The review also includes studies on the identification of platforms and entities that evaluate journals and the quality criteria they use. The application of quantitative and qualitative methodologies has made it possible to systematize both the types of journal platforms and the types of evaluation criteria and indicators. The thesis organizes the classes of platforms that collect and assess scientific journals while structuring the quality criteria of publications into three types: editorial criteria (administration and procedures), bibliometric criteria (impact factor), and dissemination criteria (use and visibility). The results obtained from the analysis of national policies for the evaluation of journals and the application of quality criteria will allow establishing a state of the art, with a diagnosis of the current situation, as well as proposing an objective model for evaluating the quality of scientific journals.

Keywords: scientific journals · indexing · editorial quality · evaluation · scientific production

1 Introduction

Scientific journals are a communication mechanism typical of any branch of knowledge. Through them, the exchange and transfer of the researchers' work are done for discussion, collective criticism, and verification, as an inherent part of the knowledge construction process [1–4].

Due to the role those scientific publications have in the process of validating and transmitting new knowledge, they face strict measurement and classification procedures in databases, directories, indexes, catalogues, rankings, and portals. The achievement of methodologies that favour this evaluative process has been the object of study in different investigations [5–13].

During the last decades, there are multiple international entities and corporations have implemented models, projects, and systems to measure the quality of scientific journals,

based on different indicators focused to eliminate the subjectivity that may arise in the selection process for indexing. The scientific quality of the journals is measured from the application of specific methodologies from the different national and international evaluation agencies, that assess the recognition granted by the indexing in the databases and by the level of citation with which it counts or not in your publication model. These degrees of scientific quality and visibility imply that they are sustained by the informative quality and the editorial process of each journal [14].

One of the main problems that arise during the evaluation is that, when applying scientific evaluation systems, generally accepted at the international level, the necessary task is not carried off to adapt them to the nature of the phenomena that are trying to be measured, or they are not taken into account the biases derived from the educational, geographic, social, cultural, and economic environments in which the evaluation systems are applied. For this reason, it is proposed that the evaluations of scientific journals be adapted to the specificities of each field of knowledge, language, and reality of each country; and not only to an impact factor extracted at a supranational level such as bibliographic indices Web of Science and Scopus [13, 15–17].

The professional literature is progressively echoing trends calling for transformation and a departure from impact ratings. Despite this, the reality is that it is still closely linked to this type of criteria. The implications derived from using these journal metrics range from a competition to publish, commonly known as publishing or die, to causing a significant deterioration in the integrity, reliability, and quality of the research executed [18].

As mentioned by Castillo Almeida [14], it is necessary and an opportunity to currently manage quality indicators in scientific publications to be indexed in new sites, portals, and databases. This research will allow, on the one hand, to identify the types of criteria used by research agencies to measure the quality of scientific journals; where not only the traditional impact indicators will be considered, but also aspects related to editorial management and the dissemination of content. Likewise, the criteria and indicators of the quality of scientific journals used in impact and use measurement platforms will be systematized to obtain an objective model for evaluating journals that goes beyond one impact metric.

The article's structure is distributed in an introduction in which the object of the investigation is presented, the exposition of the hypotheses being investigated, the applied research methodologies, and the first results. The main contributions are found in the results section, which offers advances in systematization that can be used as an objective method of evaluating scientific publications.

2 Hypothesis/Thesis and/or Problem Statement

As stated in the Research Plan of this doctoral thesis [19], this research has as its main hypothesis to state that the value of a scientific publication should not be restricted to its impact in terms of citations, so a study is required in that useful indicators be determined

to establish the quality of scientific journals. In this way, the working hypothesis is developed into research questions, as well as the main objectives to be achieved.

Research Questions

1. What are the characteristics of scientific journals?
2. What are the national evaluation policies used for scientific journals?
3. Are there coincidences in the evaluation systems implemented in scientific journals?
4. What are the inclusion criteria applied by the main databases and specialized resources to index serial publications?
5. Is it possible to establish an objective model for the evaluation of scientific journals?

Research Objectives/Goals

1. Expose the basic characteristics that define a scientific journal.
2. Describe the policies used by national agencies in the evaluation of serial publications.
3. Compare the elements that make up the various journal classification systems.
4. Identify the typology of criteria used by the platforms to measure the quality of periodical publications.
5. Propose objective criteria for evaluating the quality of scientific journals.

3 Research Approach and Methods, Including Relevant Rationale

The topic to be investigated requires the use of different research methodologies where comparative studies are fulfilled on different sources of information, models, and journal platforms. First, a systematic review will be used to identify the state of the art. Next, we will work with historical methodologies, to have the chronological development of the analysed models. Quantitative methodologies will be used, based on the examination of the data obtained in a comparative study of the models. Qualitative methodologies (interviews, Delphi) will also be necessary to establish the guidelines supporting the conclusions.

The type of research that will be done is descriptive of a documentary nature, with a bibliographic content analysis technique and executing the phases of documentary selection, model analysis, and comparative analysis. For the development of the methodology, previous research carried out by the doctoral student and her director concerning quality evaluation systems in scientific journals will be taken into account [20].

Regarding the documentary analysis, it will be based on scientific articles, books, manuals, and measurement methodologies from the year 2006 to 2022. The year 2006 is taken as a reference since it is where the first national models of evaluation of journals are proposed, choosing the significant elements of the assessment of the quality of scientific publications, as well as their procedures and management into account [21, 22].

The documentary selection will be made through the filtering of documents with a bibliometric analysis implemented in the systematic review of the literature. To locate

the state of the question, a first approach will be done through a systematic mapping of the literature and, in extension, a systematic review of the literature. The objectives of both approaches focus, respectively, on exploring that current research is focused exclusively on national research agencies and that their main content evaluation models for indexing and certification scientific journals. This allows obtaining a global vision of the state of the art in these stages, from the consolidation of the concept of journal evaluation methodologies, to how it is carried out today [23–25]. This phase involves the search, codification, impact, statistical evaluation, interpretation of the contribution of the results, and the possibility (if feasible) of a meta-analysis of the topic [26].

The geographical demarcation may be a limitation on the transfer of results. Therefore, the next methodological step will consist of the examination of the models where the procedures used in the national evaluation agencies will be examined together with the indicators used in the countries studied. For this reason, calls for quality measurement of scientific journals, application guides, internal processes, and other related instruments will be described, located, and analysed for the research agencies of the countries under study. And finally, a comparative analysis (benchmarking) will be carried off, where once the information is gathered and processed, the common criteria present in the different editorial policies of the journals of the studied countries will be identified and an evaluation methodology with quality indicators beyond impact will be proposed.

4 Results to Date and Their Validity

The results of this research are obtained in different phases. Previous research was realized by the Ph.D. candidate and her director of quality evaluation systems in scientific journals [20]. Since the completion of the master's thesis, it has been possible to identify how the evaluation of journals is being applied in different countries (Argentina, Chile, Colombia, Spain, and Mexico), as well as what are the competencies, criteria, and policies that they make, what they do it for and what it's for. Similarly, it focused on a set of indicators and measuring elements, from which it was possible to extract a classification in scales that sought or at least approached, a categorization of scientific journals in classes directed to their integral quality, taking into account the score of all its elements and components. These categories do not exclude each other, but rather determine a ranking, had the objective of guiding the internal evaluation of a journal.

Table 1 aggregates in a single model the indicators and components used by the national evaluation systems for scientific journals. The indicators in which this classification is structured and its corresponding elements are being analysed in the ongoing research, which will allow the proposal of an objective, homogeneous and balanced model for evaluating the quality of academic journals.

The work accomplished, in the first year of the doctoral program has made it possible to identify both the types of evaluation platforms for journals and their quality criteria. The systematization of platforms and criteria has made it possible to apply a methodology to find out which criteria are used and which are the most relevant.

The platform classification used is structured into three groups, according to the main value or orientation of each platform: 1. Impact or metrics (JCR, SJR, Google Scholar Metrics); 2. Content or publications (RedaLyC, Dialnet metrics, REDIB); and

Table 1. Homogeneous list of criteria for the evaluation of scientific journals [20].

Indicators	Components
Internal composition	ISSN identifier
	Institution responsible for publishing the journal
	Qualified editorial and scientific committee
	Composition of authors
	Editorial policies for access and use
	Peer review process
Content quality	Online editing formats
	Journal management system
	Article metadata
	Compliance with publication times
	Historical access to the contents
	The volume of research articles published per year
Accessibility	Homepage of the journal in Spanish and English
	Compliance with the periodicity declaration
	Navigation and functionality access
	Interoperability
	Searchers
	Use of statistics
Visibility	Inclusion in Citation Bibliographic Index- IBC: Journal Impact Factor (JIF), Journal Citation Indicator (JCI), CiteScore
	Inclusion in other indexes: Latindex catalog, H-index, Google Scholar, SciELO
Ethical aspects	Ethical code
	Anti-plag system
	Conflict of interest
	Digital Preservation
Dissemination	Altmetric.com
	Plum X
	ImpactStory
	Mendeley Readers
	Social networks

3. Quality or management (MIAR, Latindex, CARHUS). Three models of each type were chosen to obtain the first results. The evaluation criteria are also grouped into three types: 1. Editorial indicators (characteristics, internal management, editorial processes);

2. Bibliometric indicators (metrics, impact factors); and 3. Dissemination indicators (use, alternative metrics). The three evaluation criteria are developed in different indicators. The matrix obtained from types of platforms and quality criteria allows obtaining significant results in the establishment of the state of the art and for the proposal of an objective model not limited to metrics.

5 Dissertation Status

Thesis in development. The first results are being prepared for publication as scientific papers. The investigation plan is now half complete and the investigation is expected to be completed within the set time.

6 Current Status and Expected Results

The results of the research show that it is possible to use an objective model for the evaluation of scientific journals that are not based solely on metrics and that also consider the management and publishing procedures, as well as the visibility and use of publications.

We have already obtained results that allow us to categorize the types of platforms that evaluate the quality of scientific journals and the criteria that they use for their measurement. The systematization of platforms and indicators has allowed applying an analysis matrix from which results are being obtained that provide significant data on how journals can be evaluated objectively. Likewise, these indicators can be processed automatically by means of tools with which the doctoral thesis is being worked. The configuration of evaluation indicators in the technological tool will provide objective and transparent evaluations of scientific journals, which will provide quality information in terms of management, the impact in terms of citation, and dissemination in terms of use.

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